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INDICATIONS FOR THE OPERATIONS OF CARDIOLYSIS, PERICARDIOTOMY AND PERICARDIECTOMY

MOSES BEHREND, M.D.
AND
RUSSELL S. BOLES, M.D.
PHILADELPHIA

Our object in this presentation is to focus attention on the subject of pericarditis and to develop greater familiarity with certain operations performed on and around the heart. That there is a definite indication for these procedures is attested by the report of many cases in the literature. It is a matter of regret that surgery involving the heart is usually deferred so long that operation can scarcely be expected to afford any relief.

While pericarditis is not a common disease, it is unfortunate that it so frequently is overlooked. Postmortem records have shown in the experience of one of us, while an intern in the Philadelphia General Hospital in 1900, that pericarditis was undiagnosed more often than any other disease. In the past ten years in the Philadelphia General Hospital, out of 19,500 postmortems, 146 cases of pericarditis were found, of which only 4 per cent had been diagnosed clinically. With the passing of the years, therefore, but little appreciable improvement has been shown in the diagnosis of pericarditis with or without effusion, despite the modern refinements in diagnosis derived from cardiograms, roentgenograms and the like. It has been noted that in many cases coming to autopsy the disease was so extensive that we feel certain that surgery could have helped save a life or at least prolong it by easing the overburdened heart had it been recognized at its inception. It is surprising to note that surgical intervention was considered only in about three cases in ten years.

By way of introduction, brief reference will be made to the etiology and diagnosis of pericarditis in its acute and chronic stages.

Pericarditis is rarely, if ever, a primary process. While it more often develops as the result of rheumatic heart disease, chorea and cardiac infarction, it likewise is encountered as a complication of such common infectious diseases as pneumonia, scarlet fever, tuberculosis and septicemia. At times it may develop in cases of empyema or other local infections, especially of the mediastinum, as a result of direct extension. Occasionally it is observed in patients with gout and diabetes, and at times it is seen as a terminal event in chronic nephritis and uremia. In some cases it is associated with chronic inflammation of the pleura and peritoneum, as in multiple serositis or Pick's disease.

Inflammation of the pericardium inevitably results in a fibrinous, serofibrinous or purulent exudate within the pericardial sac. In pneumonia and other acute severe infections the exudate is of a purulent type, while in the other conditions mentioned it is usually of a fibrinous or serofibrinous nature. In the absence of much effusion, the pericardial sac may be obliterated in part or completely as the result of adhesions, such a process usually being the result of rheumatic infection in childhood. Occasionally such obliteration may follow a tuberculous infection. Adhesions resulting from acute pericarditis may involve neighboring structures, especially the posterior mediastinum, pleurae and diaphragm. In such cases, signs of venous congestion are present and the condition is referred to as chronic mediastinopericarditis, or constrictive pericarditis.

It is unfortunate that a peculiar lack of symptoms frequently causes acute pericarditis to be overlooked. A suspicion of it may not be aroused because it is invariably a secondary process and such symptoms as it might create, such as precordial pain, dyspnea, palpitation and weakness, are apt to be masked by those of the primary disease. It is obvious under the circumstances that pericarditis will be recognized more frequently than it is only by one maintaining a constant vigilance and an awareness for its presence in all the more common conditions previously referred to in which it may be expected to occur.

Careful attention to physical signs affords the only reliable means of diagnosis. As stated before, there are no particularly significant symptoms characteristic of the disease in its early development. Even precordial pain, an acknowledged uncertain symptom, may be absent. In the fibrinous stage, a certainty that the disease exists may be felt only if the characteristic "to and fro" friction is audible. The friction may be heard anywhere over the precordium but particularly is to be found to the left of the sternum in the fourth and fifth interspaces. It characteristically appears to be close to the surface and corresponds closely to the systole and diastole of the heart. It is notoriously evanescent, lasting for several weeks or perhaps but a few hours, and may recur at most unexpected intervals. Once a friction rub has been heard, repeated careful search should be made for effusion. Roentgenologic examinations should be employed, if practical, as soon as the diagnosis of pericarditis has been suspected or established. By this means the earliest evidence of effusion may be secured. As the effusion accumulates, definite physical signs make their appearance and x-ray examination reveals a characteristic "water bottle" shape of the cardiac shadow. That an effusion is purulent may be suggested by the nature of the primary illness, such as

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From the Medical and Surgical Departments of the Philadelphia General, Mount Sinai and Jewish hospitals.

pneumonia or empyema, an increased elevation of the temperature, and increasing leukocytosis. Chills, sweats and a rapidly developing anemia likewise indicate the presence of a purulent process and the necessity for paracentesis. If pus is shown to be present, immediate pericardiotomy is advisable.

In chronic adherent pericarditis, evidence of venous congestion is shown by increased venous pressure, engorgement of the cervical veins, enlargement of the liver and spleen, and ascites. When the pericardium is thickened and adherent and the sac is obliterated, the heart is smaller than normal. According to Willius,[1] calcification in the pericardium is found in about 10 per cent of cases of adherent pericarditis. In chronic mediastinopericarditis the heart is enlarged, presumably the result of the usually associated valvular disease rather than the handicap of surrounding adhesions. As the result of extrapericardial adhesions, such phenomena as systolic retraction in the region of the apex or posteriorly in the eleventh and twelfth interspaces, fixation of the apex beat or of the diaphragm and a pulsus paradoxus are usually to be observed. In any type of pericarditis, the assistance offered by x-ray examination may be found indispensable, especially in cases under surgical consideration.

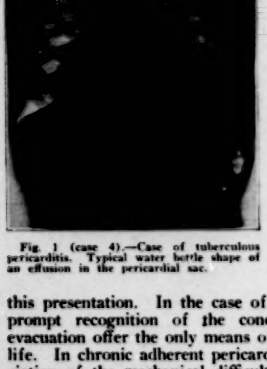

Fig. 1 (case 4).—Case of tuberculous pericarditis. Typical water bottle shape of an effusion in the pericardial sac.

While a serofibrinous effusion may occasionally require such a minor surgical procedure as paracentesis, it is the purulent effusion and the chronic adhesive type of pericarditis, requiring more radical surgery, that engages our attention in this presentation. In the case of a purulent effusion, prompt recognition of the condition and adequate evacuation offer the only means of saving the patient's life. In chronic adherent pericarditis, a proper appreciation of the mechanical difficulties under which the heart is laboring and competent surgical correction of these difficulties may be expected to afford a more comfortable and useful existence for the patient than can otherwise be attained.

In a scholarly review of the literature on pericarditis, White [2] in 1935 quoted Galen (160 A. D.), Richard Lower (1669), Lancisi (1728), Morgagni (1760), Chevers (1842) and Wilks (1870) as all having recognized the existence of this disease, their description comparing favorably with those of modern authors. Of fifteen cases of chronic constrictive pericarditis, White in 1925 reported the first surgical cure in America in a girl 15 years of age. This patient has remained in excellent health for seven years. In these fifteen cases the symptoms were typical of adhesive pericarditis; that is, dyspnea, edema of the feet and ankles, edema of the face and upper part of the body, and ascites.

1. Willius, F. A.: Proc. Staff Meet., Mayo Clin. **11**: 312 (May 13) 1936.
2. White, P. D.: Guy's Hosp. Rep. **85**: 264-273 (July) 1935; Lancet **2**: 539 (Sept. 7), 597 (Sept. 14) 1935.

After the paper by Wilks the Germans became the leaders in the study of chronic constrictive pericarditis, and such men as Pick in 1896, Rehn in 1920, and Sauerbruch, Springer and Schmieden in 1923 and 1925 did important work in connection with this disease. The palm of distinction, however, belongs to Delorme,[3] who as early as 1898 urged pericardial resection or decortication. Although Delorme was one of the first to advise excision of adhesions or decortication of the heart, he never practiced it himself.

Brauer [4] in 1902 advised removal of the bony precordium so that the heart would strike soft structures instead of a solid wall. This operation is of particular benefit in patients suffering from massive hypertrophy of the heart. In cases of adhesive pericarditis, however, the Brauer operation does little good unless it is supplemented by decortication. This opinion is confirmed by Bourne, Cutler, Beck,[5] Poynton and Hirschfelder, Schmieden [6] and Trout,[7] who state that the operation of cardiolysis with decortication is generally beneficial.

Smith and Liggett [8] in 1928 analyzed 107 cases of cardiolysis, which showed a mortality within three months of 20.6 per cent; 84 per cent of the patients had improved, 29 per cent becoming self supporting.

The Brauer operation owes its popularity to the fact that it is less hazardous. Beck stresses the fact that while the Brauer operation is less dangerous it attacks only the peripheral terminus of the cicatrix on the thoracic wall and that pericardiectomy, which was first performed by Hallopeau in 1910, is the more satisfactory operation. In Beck's estimation the Brauer operation is obsolete.

In 1934 Beck and Cushing [9] discussed the subject of pericardial disease very fully. They described two different groups of symptoms, depending on whether the pressure is acute or chronic. Acute intrapericardial pressure is caused by hemorrhage, rupture of the heart or rapidly progressing suppurative infection. The clinical picture gives evidence of engorged veins, raised venous pressure, failure of arterial circulation, unconsciousness and faint heart signs. In the second type, chronic intrapericardial pressure results from the presence of effusion or adhesions such as follow a tuberculous infection. Here the clinical picture shows rise of high venous pressure, large liver and spleen, ascites and all the symptoms coincident with adhesive pericarditis. They report nine cases, six in which operation was done, with two deaths.

A year later, in 1935, Beck [10] found that all intrapericardial lesions result in acute or chronic compression of the heart. Some of these cases give no symptoms and therefore cannot be recognized during life. The combination of extrapericardial and intrapericardial adhesions presents definite symptoms. In acute cardiac compression pericardiotomy should always be performed to determine the cause, whereas in chronic cardiac compression due to adhesions the Delorme decortication is advised.

3. Delorme, Edmund: Gaz. d. hôp. **71**: 1150, 1898.
4. Brauer, Ludolph: Münch. med. Wchnschr. **49**: 1072, 1902; Centralbl. f. Chir. **29**, 1903.
5. Beck, C. S.: The Surgical Treatment of Pericardial Scar, J. A. M. A. **97**: 824 (Sept. 19) 1931.
6. Schmieden, Victor: Surg., Gynec. & Obst. **43**: 89 (July) 1926.
7. Trout, H. H.: Release of Pericardial Adhesions, J. A. M. A. **96**: 293 (Jan. 24) 1931.
8. Smith, E. S., and Liggett, H. S.: Proc. Inter-State Post-Grad. M. Assemb. North America (1928) pp. 489-502, 1929.
9. Beck, C. S., and Cushing, E. H.: Circulatory Stasis of Intrapericardial Origin, J. A. M. A. **102**: 1543 (May 12) 1934.
10. Beck, C. S.: Two Cardiac Compression Triads, J. A. M. A. **104**: 714 (March 2) 1935.

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Winkelbauer and Schur [11] advocate decortication of the left ventricle, especially when edema is present. They think it inadvisable to complete the operation in one stage. They perform, in the first stage, Brauer's operation for cardiolysis and object to the removal of calcified areas because the puncture of the left ventricle is impossible to close. In their report of eight cases, one patient was completely cured, three died, and there was improvement of the condition in the rest of the patients.

Griswold [12] in 1936 reported one case of pericardiectomy. Symptoms followed Beck's triad; namely, high venous blood pressure, ascites and a small quiet heart. He mentions the use of the roentgenkymogram as supplying irrefutable evidence of the reduced amplitude of cardiac pulsation and the throttling effect of the disease on the heart. After operation it showed the unmistakable benefits of pericardiectomy.

It will be noted that no attempt was made in the cases reported to control the rhythm of the heart at operation by the intrapericardial administration of drugs or to prevent an anticipated disturbance of rhythm by the preoperative administration of drugs, as has been referred to by Mautz.[13] It would seem desirable, nevertheless, to consider such therapy in patients undergoing cardiac surgery.

REPORT OF CASES

CASE 1.—B. G., a white girl, aged 14 years, admitted to Mount Sinai Hospital June 1, 1925, was referred by Dr. H. B. Shmookler for operation. The primary diagnosis was aortic and mitral valvulitis and adherent pericarditis. The chief complaints were dyspnea, palpitation, weakness and pain. The patient had two previous admissions for heart disease. There was marked pulsation of the vessels in the neck; the apex beat was in the sixth interspace, 1 inch (2.5 cm.) outside the nipple line. Sounds were loud but not clear. There was no edema or cyanosis. A diagnosis of pericardial effusion was made, confirmed on the nineteenth by the cardiologist. X-ray films showed marked enlargement of the cardiac shadow, particularly on the left side. There was a strong suggestion of pericardial effusion.

The patient was readmitted to the hospital Oct. 29, 1926. On the second admission a history was obtained that she had been in the hospital four years before complaining of dyspnea and precordial distress of two years' duration. She had had scarlet fever and soon afterward typhoid.

Physical examination revealed a markedly enlarged heart with a double murmur at the apex and a systolic murmur at the base.

She had been admitted to the hospital a second time Sept. 10, 1923, with the same symptoms. The heart at this time was much larger. She was again discharged after successful treatment.

She was admitted a third time June 1, 1925, with the same complaints as previously. She had fever at this time and signs indicated pericarditis with effusion, which was confirmed by x-ray examination.

Blood cultures were sterile. The blood count showed mild polymorphonuclear leukocytosis. The Wassermann reaction and urinalysis were negative.

She was discharged again with the pericardial effusion entirely gone. On the fourth admission, Oct. 29, 1926, she was markedly dyspneic. The chest showed bulging on the left side around the precordium, with diffuse pulsations all over the precordium. The heart was greatly enlarged in all diameters. Murmurs were the same as on previous examinations. The blood pressure was 180 systolic, 130 diastolic. The heart occupied more than two thirds of the entire chest. After surgical consultation it was decided to resect several ribs to provide more room for the heart.

The diagnosis was adherent pericarditis; pancarditis with marked pericardial effusion; extensive hypertrophy with terminal dilatation, and terminal pneumonia.

At the operation, Nov. 9, 1926, the third, fourth and fifth ribs on the left side were resected and the wound was closed with clips. The pulse and respiration rate were increased. The wound healed well.

December 3 the patient was allowed out of bed in a chair. December 7 the temperature began to rise. The patient had an attack of nosebleed. The temperature ran an irregular course. From this time on the patient started to decline rapidly and eventually succumbed on December 27 from cardiac failure.

Summary.—A girl, aged 14 years, gave a history of scarlet fever and typhoid in childhood. She was practically hospitalized off and on for four years prior to operation. Scarlet fever was probably the cause of the pericardial infection. She had a huge heart. The third, fourth and fifth ribs were resected but the pericardium was not stripped. She was able to get out of bed twenty-four days after operation. Forty-seven days after operation she died of cardiac failure.

CASE 2.—J. J., a Negro boy, aged 12 years, admitted to the Jewish Hospital, Jan. 9, 1934, was referred by Dr. J. C. Doane for operation. The primary diagnosis was pericarditis and polyserositis. The chief complaint was dyspnea and pain over the precordium, cough and palpitation. The sickness dated from September 1933 following a "cold." He was told at that time that he had heart disease and an enlarged liver. Edema was present. He had had several aspirations of the chest and abdomen in the Philadelphia General Hospital, where he had stayed four months. He had had whooping cough, measles and chickenpox. He was a fairly well developed boy, though somewhat emaciated. The apex beat could not be felt; sounds were distant. The liver was palpable.

Fig. 2 (case 5).—Case of purulent pericarditis and empyema, postpneumonic.

January 11 bilateral thoracentesis was done, yielding 14 ounces (420 cc.) from the right pleural cavity and 16 ounces from the left pleural cavity.

The blood chemistry was negative.

January 13, the Mantoux test was positive.

January 18, a pericardial tap was done and 15 cc. of turbid fluid was obtained. The cardiologist reported no definite evidence of myocardial disease, although there was some interference with function of the heart muscle.

X-ray examination confirmed the diagnosis of a huge heart with pericarditis and effusion.

Up to March 6 the pleural cavities were tapped almost daily. The diagnosis was rheumatic pancarditis, mitral stenosis and regurgitation, aortic regurgitation and pulmonic regurgitation.

March 6 the first stage of cardiolysis was performed. Portions of the third and fourth ribs were resected under local anesthesia.

March 21 the general condition seemed to be much better. There was little evidence of fluid in the pleural sacs and abdominal cavity.

April 3 the second stage of cardiolysis was done under local anesthesia. At this time the second and fifth ribs were removed. The tissue over the pericardium was incised and the adhesions of the visceral pericardium were manually separated. Excision of the pericardium was now performed. The inflammatory tissue in some places over the anterior surface of the heart was 1 inch (1.27 cm.) thick. The incision was then enlarged and as much as possible of the inflammatory tissue was excised; the anterior surface of the heart was freed from the parietal pericardium and exposed about 4 inches (10 cm.) in a vertical direction and about 3 inches (7.6 cm.) in the opposite direction.

11. Winkelbauer, A., and Schur, M.: Med. Klin. 31:1231 (Sept. 20) 1935.
12. Griswold, R. A.: Chronic Cardiac Compression Due to Constricting Pericarditis, J. A. M. A. 106:1054-1057 (March 28) 1936.
13. Mautz, F. R.: Thoracic Surg. 5:612-628 (Aug.) 1936.

April 13 the child appeared to be clinically worse, respiration was labored, the pulse was weak, and the sclera were icteric. The child became gradually worse and died suddenly April 15.

The pathologic examination, by Dr. Levine, revealed numerous giant cells, early caseation necrosis and typical tubercle formation. Some sections showed a considerable degree of calcification. There was also an extensive degree of fibrosis. The diagnosis was tuberculous pericarditis.

Summary.—This patient was a very sick child when admitted to the Jewish Hospital, having had a previous admission in the Philadelphia General Hospital, where he stayed four months. He was unable to lie down. He was waterlogged, having ascites and edema of the legs; on account of the tuberculous infection he appeared to be in a hopeless condition. The operation was performed in two stages under local anesthesia. In the first stage the third and fourth ribs were removed; in the second stage the first and fifth ribs were removed. The pericardium was from one-fourth to one-half inch thick in some places and was excised. At one time in his course of convalescence, recovery semed assured. The patient lived forty days after operation.

Fig. 3 (case 5).—Lateral view

Case 3.—F. S., a white youth, aged 17, admitted to the Philadelphia General Hospital, Sept. 9, 1935, was referred by Dr. Boles for operation. The primary diagnosis was rheumatic pancarditis and rheumatic adherent pleuropericarditis. The chief complaint was pain over the heart, both shoulder joints and elbow joints. The patient had been discharged from the hospital Aug. 9, 1935, having recovered from an attack of acute rheumatic fever, during which acute pericarditis and pneumonia had developed. He had had three prior attacks of acute rheumatic fever but had been comparatively well, except for terrific palpitation and dyspnea, until ten days previous to admission, when he began to have severe precordial pain, which was greatly aggravated by any movement or deep breathing.

The significant facts in this case were as follows: temperature 102 F., pulse 130, respiration rate 32, blood pressure: 132 systolic, 40 diastolic. The patient appeared extremely ill; he was dyspneic and cyanotic in the lips and nail beds. There was no remarkable engorgement of the cervical veins. The heart was tremendously overactive, the entire bed literally vibrating from the tumultous action. The entire front of the chest was extremely tender. The cardiac area of dulness extended deeply into the left axilla and there were signs of mitral and aortic valvular disease. The abdomen was tender. The liver and spleen were not palpable. There was no edema.

X-ray examination showed the transverse diameter of the heart to be slightly enlarged. The trachea was in the midline. There was slight enlargement of the left auricle. The heart was pulled over to the left.

The cardiogram showed notching of the T waves in leads 1 and 2 and slight notching of the ventricular complexes in the direct leads. Direct and indirect leads showed a slight left axis deviation.

Urinalysis was negative except for a trace of albumin. The blood count revealed hemoglobin 15 Gm., red blood cells 5,010,000, white blood cells 15,500, polymorphonuclears 80 per cent, lymphocytes 20 per cent. The Kahn reaction was negative. The blood sugar was 77 mg. and blood urea 13 mg.

A diagnosis of rheumatic pancarditis with pleuropericardial adhesions was made. Because of severe, intractable precordial pain that had persisted for more than three months, cardiolysis was advised.

Jan. 31, 1936, cardiolysis and pericardiectomy were performed under endotracheal gas, oxygen and ether anesthesia. A curved incision was made over the cardiac region. The fourth and fifth ribs were exposed. The periosteum was reflected and 3 inches (7.6 cm.) was removed from the anterior portion of these ribs. The parietal pericardium was opened and numerous adhesions were found between the heart and this membrane. These were freed digitally and a section of anterior parietal pericardium about 10 cm. in diameter was removed and the wound closed.

The pathologic examination, by Dr. H. P. Custer, revealed dense fibrous tissue and a minor degree of residual chronic inflammation of nonspecific type, the exudate being largely lymphoplasmocytic; activity of rheumatic inflammation was apparently subsiding. The pathologic diagnosis was chronic proliferative pleuropericarditis.

Summary.—This case was one of typical rheumatic pericarditis. The patient was in the hospital for six months. Prior to his operation he complained almost continuously of severe precordial pain that required the constant use of narcotics. The operation, which was a Delorme decortication of the pericardium, entirely relieved the pain. After a stormy convalescence, during which pneumonia developed, the patient made such a favorable recovery that he was permitted to leave the hospital and go home. About two months later he died suddenly while walking upstairs. A postmortem examination was not made.

Case 4.—C. S., a Negro, aged 39, admitted to the Philadelphia General Hospital May 2, 1936, was referred by Dr. Boles for operation. The primary diagnosis was tuberculous pericarditis with effusion. The chief complaint was fever. The patient had been perfectly well until Sept. 4, 1935. He had been drinking heavily and he was suddenly seized with precordial pain and palpitation and dyspnea. The point of greatest pain was to the left of the sternum in the fifth interspace. Attacks of pain, palpitation and dyspnea recurred at irregular intervals, usually being induced by exertion, until April 31, 1936, when he had an unusually severe attack, the pain this time being referred to the back of the chest on the left side, accompanied with fever. The pain lasted about two hours, but the fever persisted and he was advised to come to the hospital.

On admission the patient appeared very toxic and had a temperature of 103 F. The pulse was 120 and respiration rate 25. The blood pressure was 110 systolic, 70 diastolic. Some dyspnea but no cyanosis was present. The heart was very much enlarged both to the right and to the left. The heart sounds were regular but somewhat muffled; no murmurs were detected. A fine "to and fro" friction sound was audible over the precordial area. A paradoxical pulse was present. There was engorgement of the veins in the neck. The liver and spleen were not palpable. There was no edema.

The urinalysis was negative. The blood count revealed hemoglobin 8 Gm., red blood cells 2,920,000, white blood cells 6,100, polymorphonuclears 82 per cent, lymphocytes 12 per cent, transitionals 6 per cent. The Kahn reaction was negative. Blood sugar was 123 mg. and blood urea 13 mg.

Fig. 4 (case 5).—Small amount of fluid in pericardial cavity. Parietal pleura much thickened. Heart small.

May 4, x-ray examination showed considerable widening of the transverse diameter of the heart and supracardiac shadow. The cardiothoracic ratio was 24 to 30.5. The entire cardiac silhouette had the "bottle" shape of pericarditis with effusion. The left diaphragm was obliterated and the right was in normal position. There was no evidence of tuberculosis in the lungs.

The cardiogram showed the ST intervals elevated in leads 2, 3 and 6 and depressed in lead 4. These alterations of the ST intervals were suggestive of pericarditis.

May 6, pericardial paracentesis was done and 270 cc. of bloody serous fluid was obtained. The patient was much more comfortable. Friction and splashing sounds over the precordium were still present, associated with high, irregular fever.

May 8, the cardiogram showed less evidence of pericarditis. There was depression of the ST intervals in leads 4 and 5. The previous slight elevation of these intervals in leads 2 and 6 was not present.

May 22, pericardial paracentesis was repeated, 450 cc. of bloody serous fluid was removed and 250 cc. of air was injected. Effusion was negative for the tubercle bacillus.

May 29, x-ray films showed no diminution of the size of the heart shadow. The patient now had a high, continuous fever and his general condition was failing. A guinea-pig that had been injected with a portion of exudate first removed was reported to be in a healthy condition after eight weeks. Because of the patient's downward course, pericardiotomy was advised. The diagnosis was pericarditis of unknown etiology, probably tuberculous.

Operation was performed June 2 under cyclopropane anesthesia. A curved 10 cm. incision was made with the convexity directed medially over the precordium. The skin flap was turned back, exposing the fourth, fifth and sixth left costal cartilages. The fifth and sixth costal cartilages were removed. Definite fulness was noted. An exploratory needle was introduced and a thick dark red fluid was obtained. The pericardium was incised and a large amount of the same fluid gushed out. The examining finger then noted that the surface of the heart was studded with small nodules. A small piece of parietal pericardium was incised for biopsy and its free surface had the same nodular appearance. No adhesions were noted anteriorly. The wound was closed with a rubber dam in the wound. The patient continued to do well after the operation. The temperature remained elevated for some time.

The pathologic examination, report by Dr. Custer, revealed that the pericardium was the seat of chronic proliferative inflammation characterized by tubercle formation and caseation necrosis. The surface was flecked with fibrin. The pathologic diagnosis was tuberculous pericarditis.

June 3, culture from the effusion yielded no growth. The smear was positive for acid-fast rods, morphologically Koch's bacillus.

June 19, x-ray examination revealed no difference in the size of the heart as compared to previous examinations. There were pleuropericardial adhesions to the left diaphragm.

The patient showed no improvement following the operation. He became gradually weaker and died August 5, two months after the pericardiotomy.

Summary.—This case proved interesting because of the doubtful character of the infection. Although tuberculosis of the pericardium was suspected, inoculation of a guinea-pig showed no changes eight weeks afterward. The fourth, fifth and sixth costal cartilages were removed. When the pericardium was incised and the finger inserted in the sac, numerous elevations were felt. Because there had been no positive evidence of tuberculosis, it was thought that the pericarditis might be of a malignant type. A piece was excised. Dr. Custer, the pathologist, reported one tubercle found and some caseation necrosis. The patient finally died of miliary tuberculosis two months following the operation. Had we had positive evidence prior to operation that the patient was tuberculous, we never would have resorted to drainage. Tuberculous effusions in any part of the body should not be drained because of the danger of mixed infection.

CASE 5.—J. M., a white man, aged 39, admitted to the Philadelphia General Hospital March 26, 1936, was referred by Dr. Boles and Dr. Hubley R. Owen for operation. The primary diagnosis was lobar pneumonia type I, pneumococcic bacteremia, and pneumococcic pericarditis with purulent effusion. The chief complaint was cough and pain in the chest. The patient was well until March 21, 1936, when a high fever and a cough developed following by a chill a few days later. He then complained of a severe sharp pain, which was aggravated by coughing over the entire right side of the chest. On admission four days after onset of illness the significant conditions were as follows: lobar pneumonia, the right, middle and lower lobes being involved; temperature 102 F., pulse 120, respiration rate 35; blood pressure 120 systolic, 60 diastolic. The pneumonia was type I and was associated with infection of the blood stream. Slight cyanosis and dyspnea were present. Herpes labialis was present. Examination of the heart revealed nothing unusual.

Urinalysis was negative except for albumin. The blood count revealed white blood cells 47,900, polymorphonuclears 88 per cent, lymphocytes 4 per cent, large mononuclears and transitionals 8 per cent. The Kahn reaction was negative; blood sugar was 134 mg. and blood urea 25 mg.

The patient was tested for serum sensitivity and, being negative, was given polyvalent antipneumococcus serum. Serum was administered at intervals until March 27, apparently with some improvement.

March 28, pericardial friction was noted, the patient complaining of severe precordial pain. A paradoxical pulse was present.

March 30 a cardiogram revealed considerable elevation of the ST intervals in leads 1 and 2. While the origin of the ST line was slightly away from the base line in leads 4 and 5, it was more marked in lead 6. "These are the findings we have encountered in pericarditis. The usual etiology in the instances in which we have seen these changes has been pneumococcic, uremic or rheumatic. We have so far not seen the change to a marked degree in tuberculous pericarditis."

March 31 the cardiac area of dulness increased to the left. There was slight cyanosis but increasing dyspnea and weakness. The leukocyte count, which previously had dropped to 34,600, was now 58,000. A diagnosis of acute suppurative pneumococcic pericarditis was made. X-ray examination revealed pericarditis with effusion. Pericardial paracentesis was done and 15 cc. of a yellowish green exudate was secured. Auricular fibrillation was present.

Fig. 5.—No fluid in pericardial cavity. Fluid level in right pleural cavity.

April 3 there was pericardial effusion: cells per cubic millimeter, 9,600; polymorphonuclears, 98 per cent; lymphocytes, 1 per cent; endothelial cells, 1 per cent; gram-positive diplococci.

April 3 the cardiogram revealed auricular flutter present, with a 2:1 and 3:1 auriculoventricular heart block. The ST intervals were elevated in leads 1 and 2.

Paracentesis of the precordium was repeated and 330 cc. of exudate recovered with immediate relief of dyspnea and weakness.

April 4 paracentesis of the precordium was repeated and 540 cc. of purulent exudate was removed. Later in the day 720 cc. of exudate was removed.

April 5, 120 cc. of purulent exudate of thicker consistency was removed. X-ray examination revealed still considerable fluid present in the pericardial sac. Pericardiotomy was advised.

April 6, under local anesthesia, a curved incision was made over the lower portion of the sternum. A flap of subcutaneous tissue and skin was turned to the side. The fourth and fifth ribs were removed 2 inches from the sternum, and the pericardium was exposed. Aspiration revealed pus. An incision was made in the pericardium and a large amount of pus was obtained. Pus drained continuously from the pericardial sac. Irrigation was instituted with various antiseptic solutions, including diluted solution of sodium hypochlorite. At times there seemed to be a diminution in pus, but nevertheless it continued in varying amounts.

April 7 the T waves were inverted in leads 1 and 2. "In the presence of pericarditis this finding is to be interpreted as due to the outer portion of the myocardium, the result of extension of the pericardial inflammatory process."

April 10, leukocytes numbered 10,900, with polymorphonuclears 76 per cent, lymphocytes 6 per cent, monocytes 18 per cent and eosinophils 2 per cent.

April 14 the sutures were removed. The Dakin tube was removed.

April 21, x-ray examination revealed no fluid demonstrable in the pericardial sac.

April 29 there were signs of empyema in the left side of the chest. Under local anesthesia a trocar and cannula were introduced in the eighth interspace of the posterior axillary line on the left side and pus was obtained.

April 30, 1,700 cc. of purulent exudate was removed from the left pleural cavity.

May 3 the patient seemed to be holding his own, with impoved drainage and daily transfusions. Suppurative pneumonitis was suspected on the right side, confirmed by x-ray examination.

The course was rapidly downward from this time on and the patient died May 7.

Summary.—This case is representative of an acute suppurative type of pericarditis, complicating lobar pneumonia. The operation had to be done with the patient in a sitting position under local anesthesia. He did not remember anything concerning his transfer to the operating room or the operation. After excision of the fourth and fifth costal cartilages the pericardium was incised and a large amount of pus exuded. The patient had a stormy convalescence requiring later a thoracotomy, closed method, for pleural empyema.

Pericardiotomy was definitely indicated in this case because of the presence of a large suppurative effusion in the pericardial sac. The patient withstood the operation well and showed striking improvement following it; despite a subsequent thoracotomy for a left sided encapsulated empyema twenty-four days after the pericardiotomy, it was thought he might recover. The development of interlobar empyema and suppurative pneumonitis in the right lung was overwhelming and he died one month following the pericardiotomy.

Postmortem Examination.—The heart weighed 400 Gm. The parietal pericardium was greatly thickened, measuring from 5 to 10 mm. in places. Thickening was due to fibrous-like tissue, presumably recently organized inflammatory exudate. The openings of the vena cava seemed to be constricted by adherent and greatly thickened surrounding pericardium. There was no evidence of hypertrophy. The histologic diagnosis was acute and organizing pericarditis, myocardial degeneration and pericardial tamponade due to a thickened pericardium.

The right lung showed obliterative fibrous pleural adhesions and encapsulated empyema at the base with interlobar empyema between the middle and lower lobes. The left lung showed obliterative fibrous pleural adhesions with encapsulated empyema at the base.

CONCLUSIONS

Three patients in the Philadelphia General Hospital and one each in the Mount Sinai and Jewish hospitals had been sick from several months to several years. The cases presented illustrate the necessity for prompt radical drainage in suppurative pericarditis, of nonsurgical intervention in tuberculous pericarditis and of earlier operation in chronic mediastinopericarditis.

A close cooperation of the internist, roentgenologist and surgeon may be expected to lead to greater accuracy in the diagnosis of pericarditis and its complications and thereby to early effective surgical treatment in properly selected cases.

1738 Pine Street.

The International Medical Congress.—Thirty-two years have elapsed—a full generation—since this congress, under the distinguished leadership of Sir James Paget, last gathered in London. Among the participants on that occasion were five of the immortals in the history of the medical sciences: Huxley—naval surgeon, zoologist, palaeontologist, educator, philosopher, public servant; Virchow—pathologist, anthropologist, archaeologist, statesman and sanitarian; Pasteur the chemist, Lister the surgeon, and Koch the bacteriologist—among the foremost contributors of all time to the welfare of their kind.—Cushing, Harvey: Consecratio Medici and Other Papers, Boston, Little, Brown & Co., 1928.

INTRA-UTERINE RESPIRATORY MOVEMENTS OF THE HUMAN FETUS

FRANKLIN F. SNYDER, M.D.
AND
MORRIS ROSENFELD, M.D.
BALTIMORE

The present observations represent an attempt to determine whether the human fetus shows spontaneous respiratory movements within the uterus or whether, as is generally believed, fetal apnea persists throughout prenatal life until interrupted at birth by the first breath.

In recent experiments with rabbits, cats and guinea-pigs, we [1] found that, instead of a state of prolonged apnea before birth, the fetal respiratory system shows long periods of automatic activity. When one now

Fig. 1.—Alveoli of fetal lung at term showing cells and débris introduced with the current of amniotic fluid entering the lung as a result of intra-uterine respiratory movements. The rabbit fetus was observed to be breathing within the amniotic fluid. The trachea was clamped and fixation in solution of formaldehyde completed within the uterus to avoid the breathing of air. The striking dilatation of the alveoli is related to intra-uterine respiration and is entirely independent of breathing air; × 300.

turns to the human fetus, the question is whether or not man is like the other species studied or stands apart.

Observations of the fetal movements transmitted through the abdominal wall were made in a series of women near term. With the woman in a recumbent position on her back, careful inspection of the abdomen was carried out. Apart from the general body movements of the fetus there could be recognized unmistakably spontaneous fetal movements, which continued at

From the Department of Obstetrics and the Department of Pharmacology and Experimental Therapeutics, the Johns Hopkins University.

1. Snyder, F. F., and Rosenfeld, Morris: Direct Observation of Intra-Uterine Respiratory Movements of the Fetus and the Rôle of Carbon Dioxide and Oxygen in Their Regulation, Am. J. Physiol. 119: 153 (May) 1937.

a regular rhythm for many minutes. The movements were integrated in a pattern that was characteristic of respiration. They were identical with the rhythmic fetal movements that are seen in other species in which there is available experimental proof of their respiratory nature.

In order to obtain objective data concerning the rate and pattern, the movements were recorded by aid of motion pictures. Analysis of these records showed a distinctive type of excursion of the abdominal wall, which occurred with regular rhythm. The excursions were clearly distinguished as independent movements superimposed on those resulting from maternal respiration. Differentiation was easily made in view of the marked difference in rate, the ratio being approximately three fetal respirations to one of the mother. Pulsations transmitted from the abdominal aorta were taken into consideration as a source of confusion but were readily eliminated. Record of the maternal pulse taken simultaneously with the respiratory movements showed that they were completely dissociated in rate. In addition, the gross characteristics, such as localization and amplitude, of the excursions permitted unequivocal differentiation.

Two chief types of fetal respiratory movements were observed. One type is characterized by a rapid rate, i. e., about 60 per minute, and a shallow excursion. The other type, which is less commonly seen, appears as a sudden deep excursion recurring at a slower rate; i. e., 15 per minute. The former resembles thoracic respiration, while the latter resembles abdominal breathing. These two types of movements were also easily distinguished in animal experiments in which the fetus of the rabbit could be directly viewed through the transparent uterine wall.

In late pregnancy the woman herself may become aware of rhythmic fetal movements, in contrast to irregular, general body movements. Patients have voluntarily made inquiry regarding the significance of fetal movements which they described as a "flutter" and which occurred usually soon after lying down and persisted for a period of minutes. We were easily able to correlate the patient's subjective description with the actual observation of transmitted fetal respiratory movements.

A clue to the significance of fetal respiration is afforded by the finding of cells and débris characteristic of amniotic fluid scattered throughout the lungs during intra-uterine life.[2] In figure 1 the contents are shown of alveoli of the lung of a rabbit fetus that was observed to be breathing within the uterus. That the breathing of amniotic fluid is a normal function of fetal respiration may be clearly illustrated by experiment.[3] In a rabbit in which the uterus was exposed by laparotomy, india ink was injected into the amniotic sac of fetuses that were seen to be breathing, as well as in littermates in which breathing was inhibited by a previous injection of pentobarbital sodium. Examination of the lungs one or more minutes after addition of the ink to the amniotic fluid showed the carbon particles in the alveoli throughout the lungs of the fetuses which were breathing, while the lungs of apneic fetuses contained none (figs. 2 and 3).

2. Farber, Sidney, and Sweet, L. K.: Amniotic Sac Contents in the Lungs of Infants, Am. J. Dis. Child. 42:1372 (Dec.) 1931.
3. Wislocki, G. B.: Experimental Studies on Fetal Absorption, Contributions to Embryology, Carnegie Institution of Washington 11:47, 1920. Snyder, F. F., and Rosenfeld, Morris: Breathing of Amniotic Fluid as a Normal Function of Fetal Respiration, Proc. Soc. Exper. Biol. & Med. 36:45 (Feb.) 1937.

COMMENT

Respiration is not initiated in the child at birth but extends far back into embryonic life. Instead of a state of complete apnea during intra-uterine life, the human fetus shows spontaneous respiratory movements for periods lasting many minutes.

The capacity of the human fetus to show respiratory movements within the uterus for brief intervals was recognized by Schultze.[4] Ahlfeld[5] noted that the human fetus exhibits rhythmic respiratory movements in the latter part of pregnancy. Weber,[6] a student of Ahlfeld, published a full description with tracings of excursions transmitted to the abdominal wall of the mother. Reifferscheid[7] confirmed these observations. Both Ahlfeld and Reifferscheid stated that fetal respiration does not normally result in the entrance of amniotic fluid into the alveoli. Other investigators among his contemporaries vigorously disagreed with Ahlfeld's inference that the movements which were seen indirectly through the abdominal wall represented fetal respiration.[8] In more recent years Ahlfeld's view has been disregarded because at operation direct observation of the fetus within the uterus failed to reveal rhythmic respiratory movements. Apnea has been regarded as

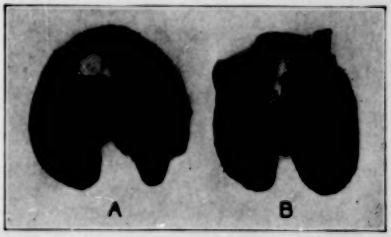

Fig. 2.—*A*, lung of apneic fetus. *B*, lung of fetus breathing within the uterus. In both fetuses india ink was introduced into the amniotic fluid twenty minutes before the animal was killed. Entrance of stained amniotic fluid into *B* and the normal appearance of *A* demonstrate that intra-uterine respiratory movements result in the breathing of amniotic fluid; × 1½

the normal state of the fetus,[9] and the cause of the initiation of respiration has been sought in the changes attending birth.[10]

Respiratory failure of the new-born, or asphyxia neonatorum, must be regarded as a suppression of previous activity rather than failure of some new mechanism to begin functioning at birth. In the apneic new-born child the question is not what causes the first breath but rather what factors have been superimposed to suppress the continuation of respiratory movements. With regard to the causes of respiratory failure, it may be emphasized that the fetal respiratory system before birth has been demonstrated to have a peculiar sensitivity to the depressant effect of anoxemia and narcosis.[1] Both of these factors belong to the period

4. Schultze, B. S.: Der Scheintod Neugeborener, Jena, 1871.
5. Ahlfeld, F.: Die intrauterine Tätigkeit der Thorax- und Zwerchfellmuskular; Intrauterine Atmung, Monatschr. f. Geburtsh. u. Gynäk. 21: 142, 1905.
6. Weber, H.: Ueber physiologische Atmungsbewegungen des Kindes im Uterus, Inaugural dissertation, Marburg, 1888.
7. Reifferscheid, K.: Ueber intrauterine im Rhythmus der Atmung erfolgende Muskelbewegungen des Fötus, Arch. f. d. ges. Physiol. 140: 1, 1911.
8. Olshausen, R.: Ueber den ersten Schrei, Berlin. klin. Wchnschr. 31: 1079, 1894. Runge, M.: Ahlfeld und seine intrauterine Athmung, Arch. f. Gynäk. 75: 199, 1905.
9. Howell, W. H.: A Textbook of Physiology, Philadelphia, W. B. Saunders Company, 1936, p. 743.
10. Barcroft, Joseph: Respiratory and Vascular Changes in Mammal Before and After Birth, Lancet 2: 647 (Sept. 21) 1935.

preceding delivery. To deal with them at that time by efforts to maintain adequate oxygenation,[11] and caution in the choice and use of anesthetic agents would be more effective than later attempts at resuscitation.

The aspiration of amniotic fluid is not an accidental complication of labor but must be viewed as a normal consequence of fetal respiration. The respiratory movements are responsible for a tidal flow of amniotic fluid into the lungs, which thus affords a mechanism for the dilatation of the future air passages. Fetal respiration thus aids in the structural differentiation of the normal lung.

The normal development of the alveoli may be complicated by the presence of amniotic fluid containing débris of excessive amount or abnormal type. A mechanical obstruction of bronchioles brought about during embryonic life may interfere with the normal

Fig. 3.—Microscopic view of lung *B*, showing the extensive distribution of carbon particles throughout the alveoli; × 80.

flow into the lung of amniotic fluid and result in incomplete dilatation of alveoli; i. e., atelectasis. Certain types of débris such as cells, meconium and sebaceous matter may be injurious not only as foreign bodies but also as chemical irritants.

In view of the rapid exchange of fluid between the pulmonary alveoli and the amniotic sac, bacterial contamination exposes the alveoli to immediate invasion by a current of infected fluid. The pathogenesis of intrauterine pneumonia may be clearly reconstructed in many cases as a complication of normal intra-uterine respiration.

CONCLUSION

Two types of injury of the lung before birth may be attributed to breathing of abnormal amniotic fluid; namely, the entrance of foreign débris resulting in obstruction and irritation, and the entrance of foreign organisms producing infection.

11. Eastman, N. J.: Fetal Blood Studies, Am. J. Obst. & Gynec. 31: 563 (April) 1936.

TWO CASES OF STREPTOCOCCIC MENINGITIS

TREATED SUCCESSFULLY WITH SULFANILAMIDE AND PRONTOSIL

MAX H. WEINBERG, M.D.
RALPH R. MELLON, M.D.
AND
LAURENCE E. SHINN, PH.D.
PITTSBURGH

Reports from European laboratories which have been confirmed by one of us have resulted in our employment of this new chemotherapeutic treatment of the more severe types of hemolytic streptococcus infection. We also wished to study its effects in comparison with that of a new type of serum treatment which has been used successfully by us for nearly a decade and which was reported in summary form recently. The present paper will be devoted to the report of two cases of meningitis, which by their nature and severity we deem to have important evidential value.

REPORT OF CASES

CASE 1.[1]—*History.*—C. S., a white youth, aged 17, admitted to the hospital Aug. 31, 1936, complained of headache, "running ear" (left), pain, fever, nausea and vomiting. He was delirious. August 28, following a swim in the river, an acute otitis media had developed. The earache became worse. Two days later fever set in. The next day nausea, vomiting and a severe headache developed, most marked over the eyes and left parietal area. The patient had difficulty in recognizing members of the family. On the day of admission, he became dizzy and complained of amblyopia.

Examination.—The boy was poorly nourished and stuporous. He had a high fever (103.6 F), a purulent discharge from the left ear, a gray purulent membrane lining the posterior pharyngeal wall, a few palpable cervical glands, and tenderness below the left mastoid.

Neurologic examination revealed a slightly obscure right disk with slight elevation and congested vessels, weakness of the left internal rectus, slight weakness of the left facial muscles, rigidity of the neck, an increase of the right radioperiosteal reflex, diminished abdominal and cremasteric reflexes, an increased right suprapatellar reflex and slightly increased right achilles reflex, and a suggestive Babinski sign on the right.

A diagnosis of meningitis and otitis media with mastoid involvement was made. A mastoidectomy was performed the same night by Dr. U. F. Rohm. He noted that when the mastoid cavity was opened much pus under pressure and necrotic cells were found. The cavity was cleaned of all denuded tissue.

The first lumbar puncture was done August 31. The cell count was 750. Fluid culture showed hemolytic streptococci.

TABLE 1.—*Treatment Used*

	Route	Dosage
Prontosil	Intramuscular injections	5 cc. three times a day for three days 5 cc. twice a day for one day 5 cc. once a day for two days
Sulfanilamide	Oral	One tablet six times a day for five days

Twenty-four hours after the operation the patient was feverish, irrational, restless and perspiring profusely. He complained of diplopia.

Prontosil[2] treatment was instituted September 1 (table 1).

Course.—On the second day of the treatment, the temperature fell 3 degrees. The patient was a little more rational, although still stuporous. On the fourth day he showed marked improve-

From the Neurological Service and the Institute of Pathology, Western Pennsylvania Hospital.

1. Dr. James McLallen in whose nose and throat service the case occurred, gave us the opportunity to treat and study this case.

2. The prontosil used was the disodium salt of 4 sulfamidophenyl-2'-azo-7'-acetylamino-1'-hydroxynaphthalene-3', 6' disulfonic acid.

V 10
1937

ment. Spinal fluid, however, still showed 850 cells, mostly polymorphonuclears, and the organisms were present on direct smear. The culture, however, grew only one or two colonies on a blood-agar plate, despite a rather large inoculum. On the fifth day he no longer complained of diplopia but was still somewhat drowsy.

Two days later, the rigidity of the neck had practically disappeared.

The next day there was again a slight rise in temperature, and then it fluctuated for several days between 100.6 F. and normal.

The patient was discharged September 15, a little more than two weeks after admission, fully recovered. A report from his physician Feb. 23, 1937, stated that the boy felt well but that he was troubled occasionally with diplopia and dizziness.

TABLE 2.—*Treatment Used*

	Route	Dosage
Prontosil	Intramuscular injections	5 cc. four times a day for two days
Sulfanilamide	Oral	5 grains every four hours for two days 5 grains every two hours for two days 10 grains every two hours for two days
Sulfanilamide	Rectal (dissolved in water)	15 grains every six hours for two days 10 grains every six hours for two days

On reexamination, Feb. 25, 1937, the patient complained of suffering with occasional diplopia and dizziness. He was doing well in his school work. On examination only a slight nystagmus to the left was found.

Laboratory Studies.—The first urine examination, Sept. 1, 1936, showed albumin 2 plus, from six to eight white blood cells per high power field, and occasional granular casts. The urine was examined daily. By the fourth day the urine was essentially normal.

The first blood count, August 31, showed a fairly normal red count and hemoglobin, but the white blood cells were 19,500, and the polymorphonuclears, 90 per cent. On the next day the white cells numbered 18,000, and two days later 11,650 and polymorphonuclears only 79 per cent. The final white cell count September 9, was 11,000. The Kahn test on the blood was negative.

Roentgen examination of the left mastoid showed a slight haziness over the entire mastoid, with some increase in the thickening of the cell walls but no definite evidence of cellular destruction.

CASE 2.—*History.*—M. B., a white girl, aged 10 years, admitted to the hospital Jan. 17, 1937, complained of discharging right ear, severe headache, vomiting and fever. She was stuporous and markedly restless. Acute right otitis media developed in the spring of 1936, requiring paracentesis twice. Except for a slight discharge from the ear, which persisted until August, the patient felt well.

Late in December the patient contracted a cold, and discharge from the ear reappeared with marked earache and slight fever. The discharge persisted until the present. One week prior to admission, intermittent headaches developed but not enough to interfere with her activities.

Jan. 15, 1937, she began to complain of pain in the neck and headache. In the evening she vomited two or three times, and this was followed by a rise in temperature. The ear began to discharge profusely. She vomited about every fifteen minutes during the night and became very restless. The fever continued to be high the next morning. She was delirious at times. On the day of admission the condition became much worse.

Examination.—The patient looked moribund. She was extremely restless and not aware of her surroundings. The left eyelid was practically closed. The right cheek was flushed. The heart rate was rapid, but no irregularities or abnormalities were noted. The patient was in stupor. The left pupil was dilated to the extreme and did not react to light. The right pupil was dilated but reacted well. The left disk was slightly hazy. Speech was lost. All deep reflexes were suppressed. The Babinski sign was present on the left. A bilateral Kernig sign was pronounced, and there was marked rigidity of the neck. The temperature (rectal) was 106.6 F., the pulse 140 and the respiration rate 70.

The diagnosis was basal meningitis, streptococcic.

Lumbar puncture was done at once. The fluid was turbid, under marked pressure, and spurting out of the needle. The cell count was 3,000 per cubic millimeter, mostly all polymorphonuclear leukocytes. Streptococci were in chains; about eight chains to the high power field were seen.

Prontosil and sulfanilamide treatment was immediately instituted (table 2).

Course. — The patient's condition remained practically unchanged during the first forty-eight hours except that ballism of the left arm and leg developed, and the left lid closed completely on the second day. The patient was found to have dysphagia. The deep reflexes of the left extremities were increased. In forty-eight hours the child seemed to be more aware of her surroundings. On the third day there were slight changes in the disks, the margins were blurred and the veins were congested. The rigidity of the neck was diminished. The deep reflexes on the right reappeared. The Babinski sign on the left disappeared. In another three days the patient was much clearer, and the dysphagia commenced to improve. Speech, however, did not return. An otologic examination revealed only a puncture but no discharge. On the ninth day after treatment was instituted, a slight yellowish tint of the skin was noted and a blood count was ordered.

Examination of the blood suggested a moderate secondary anemia, and sulfanilamide was discontinued the next day, January 27. Supportive treatment was given. Speech commenced to return but was typically bulbar. Three days later the patient could carry on a conversation, but speech was still bulbar. The dysphagia practically disappeared. In three more days, slight movement of the left upper lid was noticed. The patient was discharged February 9, twenty-three days after admission, in fairly good condition. It was the first time the patient could cooperate fully.

Fig. 1.—Culture made with half a drop of first spinal fluid specimen, showing numerous colonies of hemolytic streptococci.

The discharge note reads: "Speech is much better. The patient states that she feels fine. Left third nerve paralysis is still complete. There is slight weakness of the left side of the face. The tongue is tremulous and deviates slightly to the left. The grip of the left hand is somewhat weak. The deep reflexes are within upper normal limits. Abdominal reflexes are normal, except that the upper left is diminished. No rigidity, no Kernig or Babinski sign.

On reexamination, March 27, ptosis of the left lid had disappeared, but the left pupil reacted only to sympathetic stimulation. Otherwise, neurologic examination was essentially negative.

The first specimen of urine showed 2 plus albumin and from 18 to 20 white blood cells per high power field. The next daily specimen showed less albumin and cells, and in about a week the urine cleared up.

The first red blood count, January 18, was normal, but the white blood cell count was 18,900, and the polymorphonuclear leukocytes constituted 88 per cent. The second count showed a slight reduction in the red cell count and hemoglobin. The white blood cells were only 14,000, and the polymorphonuclears 77 per cent. The third blood examination showed the same red cell count, but the white blood cells had again risen to 20,300, and the polymorphonuclears were 82 per cent. There were also three nucleated red cells, and numerous red cells showed polychromatophilia.

The next day, January 26, hemoglobin was below 70. Blood smear showed moderate anisocytosis with numerous microcytes. There was an occasional nucleated red blood cell. Numerous cells showed polychromasia.

The next three examinations done after discontinuance of the medication showed gradual improvement in the blood picture.

Spinal fluid examination was done every two days (table 3).

COMMENT

Even though a case of recovery of streptococcic meningitis by other methods of treatment is occasionally reported in the literature, the hopelessness of this condition is recognized by all writers on this subject. Thus Gray,[3] including his own case, could find only sixty-one cases of recovery in the years 1901-1935. He considers it a "usually fatal disease." Zeligs[4] states: "Recovery from streptococcic meningitis rarely occurs. Kolmer stated that the mortality is almost 100 per cent. In a series of thirty-three cases from the University of Michigan Hospital, there was only one recovery. During the past fourteen years there have been fifty-seven verified cases of streptococcic meningitis in the wards of the Cincinnati General Hospital." In this series only one recovered.

Fig. 2.—Culture made with five drops of second spinal fluid specimen, showing no growth.

Caussé, Loiseau and Gisselbrecht[5] are the only ones to report a case of meningitis due to hemolytic streptococci treated with prontosil. Their case was apparently not of a very severe type. The highest cell count was 92, but a direct fluid smear showed short chains of streptococci, and the culture was positive. The patient recovered.

It is because of the extremely high mortality in streptococcic meningitis that we consider the successful result of two consecutive cases—the only ones we had opportunity to treat—of great significance and of sufficient importance to report promptly, so that the profession generally will try this method in as large a group of cases as possible.

Of the two cases, the second is the one that merits the greater attention. The patient was practically moribund when she was admitted. From both the clinical and the bacteriologic standpoint the patient appeared to be doomed. Dr. Hadley, chief of bacteriology at the institute, made the following comment in his report: "During the past two years at this hospital, no cases of streptococcic meningitis showing such a large number of organisms per field in the direct microscopic examination has lived for more than twelve hours after the spinal fluid was taken." Clinically we felt equally despondent. The child had marked bulbar involvement, and the dysphagia was almost complete. We think that the successful outcome in a case so severe is nothing short of dramatic.

There is no reasonable doubt that a noteworthy bacteriostatic and probably a bactericidal effect of the spinal fluid is present. It is particularly clear cut in the second case, in which no growth of streptococci occurred after treatment, despite the fact that ten times the original inoculation was employed. The relative sparsity of streptococci present in the smears supported this finding.

Moreover, Bambas of this laboratory in a series of carefully conducted bacteriostatic tests found that when 125 of the patient's streptococci were incubated in the patient's fresh spinal fluid about half of them refused to grow after eight hours incubation of the fluid at 37 C. After twenty-four hours none grew. This was in marked contrast to normal serums when seeding of 125 hemolytic streptococci often multiply in twenty-four hours to 2,000.

Of the ultimate fate of these inhibited or killed organisms in the human being little is known. In our studies of several hundred mice we have found no evidence that they were phagocyted either by the polymorphonuclears, the mononuclears or the reticuloendothelial system of the liver or spleen (Dr. Paul Gross).

These observations are not in accord with the observations of Long and Bliss, who on the basis of appearances in one mouse and its companion control believe that phagocytosis plays an important rôle. Differences in strains may conceivably account for the discrepancies.

TABLE 3.—*Spinal Fluid Examinations in Case 2*

	Pressure	Cell Count	Globulin	Direct Smear	Culture
1/17/37	Fluid spurted out	3,000 (polymorphonuclears)	.....	Organisms present; chains	Positive
1/19/37	Slight	2,500 (polymorphonuclears)	3 plus	Present	Negative
1/21/37	Normal	1,450	2 plus	Absent	Negative
1/23/37	Normal	150 (70% polymorphonuclears; 30% lymphocytes)	1 plus	Absent	Negative

The question of dosage and method of administration cannot be answered definitely as yet. The drug does not seem to be very toxic, so it is rather safe to use. Attempts at standardization of dosage are already being made. We have given normal individuals as much as 4 Gm. a day and our type III pneumonia patients who have shown a remarkable response (about 75 per cent recovery) have often received as much and sometimes more, daily.

Colebrook's bacteriostatic in vitro tests indicate that 1:10,000 dilution of the drug is an optimum concen-

3. Gray, H. J.: Streptococcic Meningitis: Report of Case with Recovery, J. A. M. A. **105**: 92-95 (July 13) 1935.

4. Zeligs, Mendel: Streptococcic Meningitis: Report of Two Cases with Recovery, Am. J. Dis. Child. **50**: 1497-1501 (Dec.) 1935.

5. Caussé, Loiseau et Gisselbrecht: Méningite purulente otogène à streptocoques hémolytiques, traitée exclusivement par un colorant azoïque; Guérison, Ann. d'oto-laryng., pp. 94-199 (Feb.) 1936.

V 10
1937

tration in the serum, and now that they have recently made available a quantitative test for the substance in the blood, the matter of the dosage promises to be worked out with more precision.

As to the rule of administering the drug, all workers agree that when swallowing is difficult the drug should be given intramuscularly. Long and Bliss quote Schwentker as having used an 0.8 per cent solution of sulfanilamide in physiologic solution of sodium chloride intrathecally in the treatment of streptococcic meningitis. Caussé Loiseau and Gisselbrecht used the drug intravenously. In view of our experience in these two cases we are inclined to think that such a hazardous form of therapy as intrathecal administration should be used only as a last resort. We have overcome the difficulty of the patient's inability to swallow the tablet by administering the drug by rectum.

Therapy should be started immediately. The bacteriostatic observations of the English workers estimate that it takes at least forty-eight hours before such effects can be obtained in the serum; and because of this the treatment should be instituted promptly. In our second case we started the treatment in one hour and twenty minutes, the time that it took to complete the neurologic examination, the lumbar puncture and the microscopic examination of the fluid after admission of the patient to the hospital.

TOXIC EFFECTS

The only possibly toxic effects noticeable were in case 2. On the ninth day of treatment the patient's skin took on a yellowish tint. Blood examinations revealed a moderate progressive decrease of the red cells and hemoglobin, and there were other changes such as a few nucleated red blood cells, polychromasia and moderate anisocytosis. With the discontinuance of the drug the condition of the blood improved. None of the other workers, who have treated many patients with streptococcic infections, noted such a change. It is possible that this is an isolated phenomenon in this particular case.

CONCLUSIONS

1. Two severely ill patients with streptococcic meningitis, one of them of the highest severity, were treated successfully with sulfanilamide and prontosil.

2. One patient recovered fully, but the second still has a partial paralysis of the third nerve.

3. In view of our clinical experience with the drug, it is urged that it be used promptly in cases of streptococcic meningitis.

Pleurisy with Effusion.—We regard pleurisy with effusion as a reinfection form of tuberculosis which develops from the focus of the first infection. The tissues are highly sensitized to tuberculoprotein through the development of the primary lesion, and bacilli are easily transmitted to the lymph channels of the visceral pleura from the lesions, which often lie near the periphery of the lung. The appearance of fluid in the pleural cavity is usually preceded by pain, and friction sounds may be elicited for a few days. When effusion begins to make its appearance and ordinary anteroposterior roentgenograms will not demonstrate it with certainty, Rigler's posture method is of great aid. When the effusion becomes larger, it is usually possible to recover tubercle bacilli from smears of centrifugated fluid or by culture and inoculation methods.—Myers, J. A.; Diehl, H. S.; Boynton, Ruth E., and Trach, Benedict: Development of Tuberculosis in Adult Life, *Arch. Int. Med.* 59:1 (Jan.) 1937.

INTERMITTENT VENOUS HYPEREMIA

IN THE TREATMENT OF PERIPHERAL VASCULAR DISEASE

GEZA DE TAKATS, M.D.
FORD K. HICK, M.D.
AND
JOHN S. COULTER, M.D.
CHICAGO

In analyzing the mechanism by which alternating suction and pressure [1] exert their effects on the course of obliterative arterial disease, we found that in four types of apparatus examined there occurred an intermittent venous stasis in the limb under treatment. The cuff attached to the thigh constricts the limb during the phase of suction and releases it during the phase of positive pressure. The phenomena of reddening of the toes and filling of the veins, the rise of surface temperature and the increased mobility of the toes, all of which can be observed as objective changes produced by passive vascular exercise,[1] can be reproduced by intermittent venous compression. It is our purpose in this communication to examine this factor, study its physiologic aspects and report on its clinical use.

THE EFFECTS OF VENOUS CONSTRICTION

In the beginning of this century, surgical thought was greatly influenced by the writings of Bier [2] on venous hyperemia. Three and a half decades later, as a summary of his vast clinical experience, he reviewed his observations and those of his school in an article of monographic proportions.[3] Bier undoubtedly established the following facts on the basis of experimental and numerous clinical observations: (1) Venous hyperemia produces a reactive hyperemia independent of nervous impulses, (2) mild venous stasis maintained for one hour produces more benefit than arterial constriction of the same duration, (3) reactive hyperemia may be produced when the larger vessels are occluded or cut as in pedicled flaps, whose pedicle had just been severed, and (4) reactive hyperemia ensues through the accumulation of metabolites and the filling and stretching of minute vessels.

It seemed necessary to restate Bier's essential observations in detail, because they are tucked away in a mass of speculative and teleological dissertations and nowhere summarized. Later workers, with accurate physiologic methods, have confirmed all these early views. Thus, Lewis and Grant [4] think that a slowly diffusible histamine-like substance accumulates in the tissue spaces when the arterial supply to a limb is occluded, causing an active dilatation of all the vessels. A similar reaction occurs, however, when venous pressure is raised, the optimum being 80 mm. of mercury. They stated that the longer the occlusion and the higher the environmental temperature, the more vasodilatation was produced. Differing from this statement, Gold-

From the Department of Surgery, University of Illinois College of Medicine and the Department of Physical Therapy, St. Luke's Hospital, Chicago. Aided by a grant of the Council on Physical Therapy of the American Medical Association and the Graduate Research Fund of the University of Illinois.

1. A complete bibliography is given by Herrmann, L. G.: Passive Vascular Exercises and the Conservative Management of Arterial Diseases of the Extremities, Philadelphia, J. B. Lippincott Company, 1936.

2. Bier, A. K. G.: Die Entstehung des Collateralkreislaufes, Virchows Arch. f. path. Anat. 147:256, 444, 1897; 155:306, 434, 1899; Hyperämie als Heilmittel, Leipzig, F. C. W. Vogel, 1903.

3. Bier, A. K. G.: Beiträge zur Physiologie und Pathologie des Blutkreislaufes, Virchows Arch. f. path. Anat. 261:751, 1933; 268:738, 1934; 270:1706, 1935.

4. Lewis, Thomas, and Grant, R. T.: Observations on Reactive Hyperemia in Man, Heart 12:73 (June) 1925.

blatt [5] found in dogs that hyperemia following vascular occlusion was maximal after 120 seconds and that longer occlusions diminished the reaction. He also made an observation, which is important from our point of view, that the reactive hyperemia diminishes after the second occlusion, unless a large enough interval (90-120 seconds) is allowed to elapse between the reactions. The shorter the interval between the two occlusions, the greater the diminution of the reactive hyperemia. When the interval was shortened to fifteen-twenty seconds, the reaction was abolished. This refractory stage is longer, the greater the preceding reaction. Recently Huggins, Blockson and Wilson [6] gave an exhaustive review of the literature and found that mechanical obstruction to arterial flow resulted in a decrease and, after release, in an increase in temperature. The greatest increments of heat occurred in the bone marrow. In studying the effect of venous constriction they did not find such a reactive hyperemia as to be measurable by an increase in temperature, although this may be detected by measurements of blood flow.

Whether this accumulating vasodilator substance is a single histamine-like substance or, as Krogh [7] and Bier [8] believe, a multiplicity of substances is here beside the point. Frey [9] believes that the increased acidity, which occurs in the anoxic tissue, activates the circulating pancreatic hormone, which is present in the blood but is in an inactive state.

Less interest has been focused on effects other than those due to the accumulation of metabolites following venous constriction. Yet the mechanical effect of filling and stretching of the venules and capillaries, when arterial inflow is unobstructed but venous backflow is interrupted, is obvious. There is a biphasic increase in limb volume when a blood pressure cuff is applied at a pressure which is below diastolic pressure.[9] During the first phase, the volume of the compressed extremity rises for fifteen to twenty seconds quite rapidly. This is due to the collection of blood in the venules and capillaries and ends when the venous pressure becomes equal to cuff pressure. The capillaries are able to contract against internal pressures of from 50 to 60 mm. of mercury. When venous pressure is raised to 90 or 100 mm. of mercury, petechial hemorrhages may occur. The second phase is due to a stretching of the vascular bed and to tissue edema. Then filtration pressure in the capillaries will be raised over the osmotic pressure of the blood. This ratio is disturbed in limbs suffering from arterial obstruction when the hydrostatic pressure falls below the osmotic pressure, so that circulation will not take place from the capillaries to the tissues.[10] This increased filtration pressure may well explain the temporary beneficial effects of concomitant venous ligations when the artery is obstructed.[11]

The elevation of venous pressure raises capillary pressure to an equal or even slightly higher level. Landis [12] has summarized our knowledge and added fundamental data on capillary pressure and capillary permeability. Capillary blood pressure at rest depends on arterial tone, venous tone, posture and temperature. The average capillary pressure is 32 mm. of mercury in the arterial limb and 12 mm. of mercury in the venous limb. When skin temperature is elevated to 42 C., this pressure can be raised to 60 mm. in the arterial and 45 mm. of mercury in the venous limb. A venous pressure of 60 mm. of mercury raises capillary pressure as high as 42 C. of heat or even higher but without the increased oxygen consumption of the cells. With regard to the rate of edema formation, Landis found that a venous pressure of 80 cm. of water (about 60 mm. of mercury) causes fluid to accumulate in the tissue spaces at only 0.20 Gm. per minute per hundred cubic centimeters of tissue. When the veins are obstructed by a cuff placed on the thigh of a dog, lymph flow is markedly increased and the lymph becomes more dilute. A pressure of 60 mm. of mercury maintained for ten minutes raised the lymph flow to 0.54 cc. from 0.1 cc., when the animal stood quietly. Exercise of any sort would quickly increase it to an even greater volume.

Capps [13] has recently studied the tonus of the venules and capillaries by measuring the increase of the volume of the hand following different cuff pressures and temperatures. Significant is his finding of a marked atony of the venocapillary system shortly after sympathectomy, which was manifested by a great increase in limb volume after applying a pressure of 20 mm. of mercury.

There is finally the effect of the slowing of the circulation on the utilization of oxygen to be considered. If the inflow of oxygenated blood is not diminished, the high intravascular tension of oxygen should lead to an increased saturation of the tissues. And truly, when strips of muscle from guinea-pigs were placed in a Warburg apparatus, their oxygen consumption diminished from one fourth to one half of the normal level after venous constriction, because they had more than the normal concentration of oxygen to start with, whereas after arterial constriction these muscle strips consumed twice as much oxygen as in the resting state, thus explaining Bier's "blood thirst" of the anemic tissue.[14]

In considering the oxygen utilization of the tissues during a slowing of the circulation, the following factors have to be considered: by raising the carbon dioxide tension, more oxygen is evolved at low oxygen tension; at lower oxygen tensions the blood gives off more oxygen. On the other hand, new oxygen is not transported rapidly enough to maintain its optimum tension in the tissues. Such a state occurs during venous constriction, a typical "stagnant anoxia" of Bancroft, which is characterized by a normal arterial oxygen tension and a low venous oxygen tension. Thus a large arteriovenous difference in tension might result from increased oxygen consumption but is here caused by retarded circulation of the blood, perfusing oxygen at a slow rate.[15] A low oxygen saturation of the venous

5. Goldblatt, M. W.: Reactive Hyperemia, Heart **18**: 281 (March) 1926.

6. Huggins, C. B.; Blockson, B. M., and Wilson, Harwell: Thermal Changes in Local Asphyxia and Reactive Hyperemia, Arch. Surg. **32**: 528 (March) 1936.

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11. de Takats, Geza, and Scupham, G. W.: Peripheral Vascular Disease: A Review of the Current Literature with a Critical Review of the Surgical Treatment, Arch. Int. Med. **56**: 530 (Sept.) 1935.

12. Landis, E. M.: Capillary Pressure and Capillary Permeability, Physiol. Rev. **14**: 404 (July) 1934.

13. Capps, R. B.: A Method for Measuring Tone and Reflex Constriction of the Capillaries, Veins and Venules of the Human Hand with the Results in Normal and Diseased States, J. Clin. Investigation **15**: 229 (March) 1936.

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blood, which is a function of low oxygen tension, signifies here a low oxygen tension in the tissues. Campbell [16] found that oxygen tension in the tissues closely approximates that of the venous blood. Therefore a venous congestion, as produced for therapeutic purposes, produces a relative anoxia in the tissues, followed by the repayment of the oxygen debt, a reactive hyperemia.

THE THERAPEUTIC APPLICATION OF ARTERIAL CONSTRICTION

Every surgeon has been impressed by the reactive hyperemia that follows the release of a tourniquet. The reactive hyperemia following arterial occlusion has been used by Cushing,[17] who intended to paralyze the vasomotor nerves in applying arterial constriction during the attack of Raynaud's disease. The constriction was kept on for from one to two minutes. The patient completely recovered from her spasms even during the winter months. More recently the orthopedic literature contains favorable reports on alternate arterial constriction and release [18] for exudates in joints and secondary vascular spasms. They combine this reactive hyperemia with an elevation of the leg to empty the blood after release. In this country Jordan [19] reported very favorably on this form of treatment. He elevates the leg for one minute with a pulley, applies cuff pressure above systolic pressure for one minute, lowers the leg in the horizontal position and releases the cuff for another minute. The whole course lasts from fifteen to thirty minutes, or ten cycles of treatment.

This group of authors used a suprasystolic pressure to produce a reactive hyperemia. This is probably an entirely harmless procedure in patients whose peripheral arteries show no organic disease and the resulting increased inflow will dilate the peripheral vascular bed. Bettmann [18a] showed an increase in the size and number of capillaries after such a procedure. In patients suffering from obliterative vascular disease, the production of even a short asphyxia and of pressure on an inflamed or degenerated vessel is inadvisable. Besides, as shown by Freeman,[20] the oxygen debt incurred during the arterial obstruction is accurately repaid after release. Reactive hyperemia following arterial constriction is fundamentally nothing but the repayment of an oxygen debt. An excess amount of blood flow occurs only when damage of tissue has been produced by the arterial occlusion. It would seem to us, then, that although reactive hyperemia after arterial occlusion does produce an impressive vasodilatation and an increase in temperature it just barely compensates for the previous asphyxia and, with partially obstructed channels, this compensation will not be adequate.

THE APPLICATION OF VENOUS CONSTRICTION

Bier used soft rubber tubing for venous stasis; this was produced from one to several hours a day. While he recorded some observations on reactive hyperemia in cases of arterial ligature and of arteriosclerotic and juvenile gangrene, a systematic series of treatments was advocated only for acute and chronic pyogenic infections, tuberculous processes and gas gangrene. One of his followers, Henle,[21] felt that the constricting pressure should be measured and brought out a rubber cuff that was inflated from 60 to 100 mm. of mercury. Thies [22] was the first to point out that hours of continuous venous compression would lead to very cumbersome and intractable indurations and advocated intermittent pressure and release. He first built an apparatus that was filled and intermittently emptied by water; later he used a carbon dioxide tank and finally an air pump to produce alternate pressure and release. He used venous compression for sixty seconds, followed by a release from ninety to 120 seconds. Thus he empirically discovered, as Goldblatt [5] had found in the animal experiment, that the duration of the release should be at least as long as that of the obstruction, preferably longer. He treated sixty-three cases of joint infections and gas gangrene in a base hospital and reported very favorable results. He warned of using the alternating pressures for more than ten days but would occasionally maintain a treatment continuously for eighteen hours.

Quite recently Collens and Wilensky [23] introduced the method of alternate constriction and release in the treatment of peripheral vascular disease. They never employed pressures over 60 mm. of mercury in congested, ulcerated or gangrenous legs and prefer to use 40 mm. of mercury. When the outstanding symptom is intermittent claudication, pressures up to 90 mm. may be applied. Judged by the subjective improvement of the patients and by objective criteria, which are admirably simple and clinically useful, their results are impressive. A further discussion of their method will be given in the comments. Our own investigations served the purpose of (1) determining, by the help of objective methods, the changes in circulation following rhythmic venous compression, (2) constructing a simple apparatus by which inflation and deflation of the cuff could be obtained at varying pressures and time intervals adaptable to the patients' individual needs, and (3) establishing the value of this procedure, which is chiefly intended for home treatment over a prolonged period of time.

OWN OBSERVATIONS ON INTERMITTENT VENOUS HYPEREMIA

A. *Blood Pressure Readings.*—When a rubber cuff is thrown around the thigh and inflated to a subdiastolic pressure, the following changes occur: The veins stand out conspicuously on the dorsum of the foot and may show a venous pulsation; the toes become pink or dusky red in from ten to 120 seconds, depending on the degree of circulatory embarrassment, environmental temperature or arteriolar spasm; the patient feels a light sense of fulness and a mild throbbing at the point of constriction, which increases with the duration of pressure; when the pressure is released, a warm wave of blood seems to rush into the congested extremity. All observations recorded here were made following the produc-

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19. Jordan, Henry: Vascular Massage, J. Bone & Joint Surg. **17**: 1021 (Oct.) 1935.

20. Freeman, N. E.: The Effect of Temperature on the Rate of Blood Flow in the Normal and Sympathectomized Limb, Am. J. Physiol. **113**: 384 (Oct.) 1935.

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23. Collens, W. S., and Wilensky, N. D.: (a) The Use of Intermittent Venous Compression in the Treatment of Peripheral Vascular Disease, Am. Heart J. **11**: 705 (June) 1936; (b) An Apparatus for the Production of Intermittent Venous Compression in the Treatment of Peripheral Vascular Disease, ibid. **11**: 721 (June) 1936.

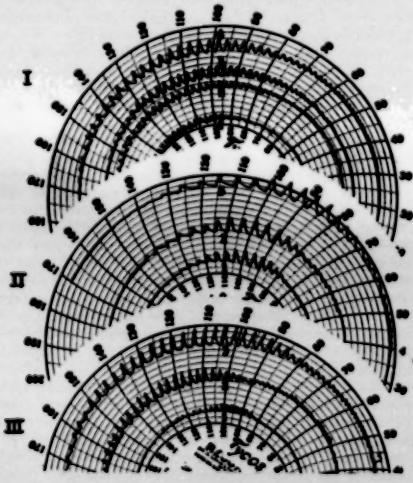
tion of a pressure of 80 mm. of mercury for two minutes and a release for from two to four minutes.

Graph I shows four oscillometric curves taken at the right ankle of a patient with normal peripheral circulation. It can be seen from these curves that venous constriction produced an increase in the height of the spikes but no difference in the systolic and diastolic pressures. Immediately after release there is a further increase in pulsation but a decrease in systolic and diastolic pressure. Four minutes after the release of the cuff, the systolic and diastolic pressures have regained their original values but the length of the spikes has further increased. The comparison of the first and fourth curves illustrates a marked change in circulation.

In graph II, a patient's lower extremities showing normal peripheral circulation have been placed under a heat cradle, thermostatically controlled. The temperature was set for 85 F. It will be noted that both during constriction but particularly after release there was a further increase in the oscillometric spikes. The blood pressure of 135/80 mm. of mercury rose to 145/80 mm. during constriction and dropped again to 132/75 mm. of mercury after the release. An increase in the height of the spikes occurred even though, at the first reading, the legs had already been exposed to heat for thirty minutes.

The same procedure carried out on a lower extremity, sympathectomized for Raynaud's disease, resulted in very marked changes after venous compression and release, as shown in graph III. As control and reflectoric vasoconstriction was abolished in this extremity, the atony of the minute vessels in response to mechanical stretching is striking. A similar result was observed by Capps,[12] who showed that following an injection of alcohol into the stellate and upper dorsal ganglions the increase in volume of the limb after slight venous pressure was considerably higher than before the injection.

Such increments in pulse waves can be observed also in patients suffering from arterial disease, although the changes are naturally not as striking. In graph IV, readings were taken from a patient suffering from Buerger's disease with considerable vessel spasm. The highest spikes are shown immediately after release, whereas two minutes later the persistent vessel spasm again diminishes the pulse waves.



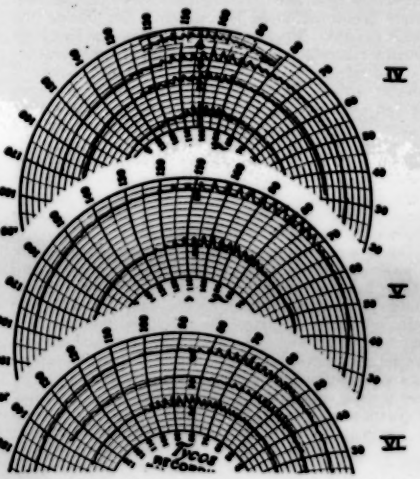


Fig. 1.—Graph I. The subject's lower extremities were exposed to room temperature of 70 F. for thirty minutes. The cuff of the manometer was at the ankle and the constrictor on the thigh. Curve 1 is the control curve. Curve 2 was obtained after thirty minutes of intermittent constriction and release, at the end of constriction and curve 3 two minutes after release. Curve 4 was taken four minutes after release of the same constriction. There was a progressively increasing pulse volume after each phase of the treatment. Note that four minutes after the release of compression the reactive hyperemia was larger than after two minutes.

Graph II. This subject's lower extremities were placed in a heat cradle under thermostatic control and exposed to 85 F. for thirty minutes. At this time curve 1 was obtained at the ankle. A constrictor was then placed on the thigh and inflated to 80 mm. of mercury, this being the individual's diastolic pressure. After two minutes of venous compression the second reading was secured. Note that the pulse waves appear at 145 mm. of mercury compared with 135 mm. during the control period. Two minutes after release the third curve was run, showing a further dilatation of the peripheral vascular bed and a shift of the oscillations to the right, indicating decreased resistance. These curves were obtained during dilatation with heat and after one cycle of treatment (two minutes of constriction, two minutes of release).

Graph III. This patient had had a lumbar sympathectomy a year previously for Raynaud's disease. The lower extremities were exposed to 75 F. for thirty minutes. The first curve indicates a marked vasoconstriction as a direct response to cool air. She then used rhythmic compression with 80 mm. of mercury at the usual rate for thirty minutes. Curve 2 was obtained at the time, during the end of compression; curve 3, at the end of release. Because of the absence of reflectoric vasoconstriction and because of the diminished tonus of the venocapillary bed, the mechanical dilatation of the vascular bed during compression and the chemical dilatation after release are more striking. Note also the shift of the spikes to the left during compression and the shift to the right during release, indicating increased and decreased peripheral resistance respectively. This shift to the left and right can be seen on all graphs but is accentuated in the sympathectomized limb.

Graph IV. This illustrates the effect of alternate constriction and release in a patient, aged 33, suffering from Buerger's disease. The reading was made at the ankle. The greatest increment in pulsation was obtained immediately after release (curve 1), whereas two minutes later the vasoconstriction again prevailed (curve 2). The curve taken during constriction shows only a slight opening of the vascular bed (curve 3). Curve 4 shows the control reading at rest. This patient later underwent a lumbar sympathectomy with marked clinical benefit.

Graph V. This illustrates the effect of fifteen minutes of constriction and release under a constant temperature of 85 F. Curve 1 is taken at the end of compression; curve 2 at the end of release. In an individual with normal circulation, exposed to moderate heat, the vasodilating effect after release is very definite.

Graph VI. This patient, suffering from diabetic gangrene, was placed on the oscillating bed of Sanders: curve 1 feet down, curve 2 head down and feet raised, curve 3 horizontal position. Note the rise in blood pressure when the feet are down and the fall when the lower extremities are elevated. In that position the venocapillary bed is emptied and peripheral resistance is decreased. The effect of the Buerger-Allen exercises is well demonstrated by these curves.

In graph V, two curves were obtained after fifteen minutes of compression and release, showing a good response after release. The temperature of the cradle was kept at 85 F. At the end of thirty minutes, however, both show much smaller spikes and a much smaller response.[24] This observation reminds one of the interesting animal experiments of Goldblatt, who found that, unless enough time was allowed to elapse after constriction, repeated arterial occlusions were followed by a refractory stage. He stated that repeated venous compression did not result in a refractory stage, but it must be remembered that if such venous constrictions are carried on for a period of thirty minutes a severe anoxia may result.

Because it was felt that, especially in patients with arterial obstruction, the venocapillary bed could not sufficiently empty during the period of release, the accomplishes this emptying by elevating the leg during treatment and by the help of the positive phase of the cycle. This can be readily accomplished by elevating the leg as in the Buerger-Allen exercises or by lifting it up with a pulley so that active muscular contractions, which consume so much oxygen, as pointed out by Reid, are avoided.

These considerations led us to adopt a triphasic cycle; namely, (1) elevation of the leg, (2) venous compression while the leg is still elevated and (3) horizontal position followed by release. The time ratios, which may have to vary according to the needs of the patient, will be described presently.

In interpreting the increased oscillations that follow both constriction and release, one must consider that the tightening of the cuff around the congested and later hyperemic extremity may be responsible for the

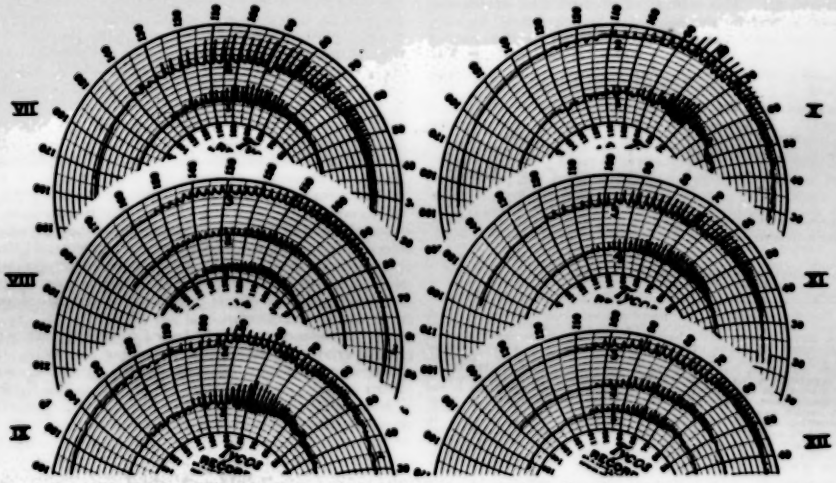


Fig. 2.—Graph VII. These curves illustrate the effect of placing the cuff of the blood pressure apparatus loosely (curve 1) or tightly (curve 2) around the ankle. Note the rise in systolic and diastolic pressures when the cuff is tight.

Graph VIII. In this graph the recording cuff was placed above the constrictor to rule out the tightening effect of constriction and release on the cuff. Curve 1 is the control curve; curves 2 and 3 were obtained after a single constriction and release respectively. The effects are similar to those obtained with the recording cuff below the constriction. It illustrates that the mechanical stretch and the chemical dilatation during constriction and release are not simulated by the tightening of the recording cuff.

Graphs IX and X. These curves were obtained from an upper extremity of an arteriosclerotic patient aged 60; the recording cuff was above the constrictor. The effects are shown in curve 1 as control, curve 2 during constriction and curve 2 on graph X after release. Note that in this case there occurred a vasoconstriction in the extremity above the inflated cuff, which is probably on a reflectoric basis, originating in the pressure of the cuff. After release, vascular relaxation is obvious.

Graphs XI and XII. These indicate the duration of reactive hyperemia, after two minutes of compression with 80 mm. of mercury: (1) immediately after release, (2) one minute after release, (3) three minutes after release, (4) four minutes after release and (5) six minutes after release. It would seem that alternate constriction and release must be so arranged that enough time is given for the full development of the reactive hyperemia. In this instance a ratio of 1:3 brought about the maximum response.

stagnating blood was emptied by elevating the leg just before a renewed compression. The effect of gravity on the blood pressure of an extremity has been emphasized by Bier,[3] Pearse and Morton [25] and Mont Reid.[26] In graph VI we show the pulse of a diabetic extremity on an oscillating bed in the horizontal, Trendelenburg and reverse Trendelenburg positions. When the leg is elevated, not only does the arterial pressure fall but the venocapillary bed empties and makes room for fresh blood. The alternating suction and pressure apparatus increased oscillations. That this actually happens is shown in graph VII, in which the cuff was first applied loosely and then tightly at the same level under identical external conditions. But it must be remembered that the tight cuff produces a venous compression "per se" and therefore this experiment could not be of decisive value. It had to be shown that increased pulsations could be obtained following venous constriction, even though the cuff remained loose. Therefore the cuff of the automatic sphygmomanometer was placed above the constrictor and not below, as in the previous experiments, in which the venous compression readily causes an increase in limb volume and, in turn, a tightening of the cuff.

24. Graph omitted because of lack of space.
25. Pearse, H. E., Jr., and Morton, J. J.: The Blood Pressure in the Arteries of the Extremities in Normal Subjects and in Patients with Peripheral Vascular Disease, Am. J. M. Sc. 183:485 (April) 1932.
26. Reid, M. R.: The General Care of Peripheral Vascular Diseases, Ann. Surg. 96:733 (Oct.) 1932.

Graph VIII shows a group of readings in which the constrictor was placed below the cuff of the sphygmomanometer. There seems to be little difference between the control curve and the curve taken during congestion, although there would seem to be a slight increase in both the systolic and the diastolic pressure, probably because of the increased resistance produced by the constrictor. Following release, one again observes a definite reactive hyperemia, with increased pulsation, the same systolic but diminished diastolic pressure, 10 mm. of mercury lower than during constriction. From these observations one may conclude that the increased pulse volume is not due to the tight cuff per se, as in these experiments the limb did not swell. In placing the constrictor below the cuff, another phenomenon became apparent; namely, a reflectoric vasconstriction originating from the pressure of the constrictor. This reflex vasoconstriction, which has been studied by the help of a "pinch reflex" by Carmichael and his associates [27] and by Capps,[13] varies, of course, in various individuals. It is well demonstrated in graphs IX and X. The release of the constrictor in the same individual, however, resulted in a satisfactory hyperemia. Both temperatures of 90 to 95 F. and a sympathectomy abolish this mild vasoconstriction.

Finally, the effect of repeated oscillometric readings was studied in a normal person. It can be seen (graphs XI and XII) that repeated readings at one, two, four and six minutes after the initial reading open up the vascular bed more and more and may thus serve as a simple test for the flexibility or rigidity of the peripheral vascular bed. Whether they have a prognostic significance in patients with arteriolar involvement remains to be seen.

TABLE 1.—*The Saturation of Venous Oxygen During Various Forms of Passive Vascular Exercise*

Type of Procedure	Case	Before	At 20 Minutes	At 40 Minutes
Suction and pressure	1	74.0	72.9	61.0
	2	65.6	53.4	39.0
	3	62.8	61.6	47.2
	4	62.5	56.4	55.2
	5	49.0	53.6	65.6
	6	54.6	32.7	39.5
Continuous venous stasis	7	81.2	78.5	65.4
Intermittent venous stasis, 2 minutes-2 minutes	8	70.2	54.3	36.9
	9	81.2	78.5	65.4
	10	80.6	65.8	56.8
Intermittent stasis and elevation, 2 minutes-3 minutes-1 minute	11	70.0	77.5	69.6
	12	60.8	55.6	62.6

The figures represent the percentage saturation of venous blood, drawn under oil from the femoral vein. In each case the carbon dioxide and oxygen content was determined by puncturing the femoral artery. The oxygen saturation of the femoral vein was used as an indicator of oxygen tension in the venous blood and in the tissues. It will be noted that in the first three cases, in which treatment was given by the A apparatus, a fall in venous oxygen occurred—most marked in case 2. In cases 4 and 5, in which treatment was given with apparatus B, the saturation rose. In case 6 treatment was given with apparatus C, which produced a marked fall as early as twenty minutes. In case 7 a mild continuous venous compression was given with 40 mm. of mercury. In cases 8, 9 and 10, intermittent compression of 80 mm. of mercury was given for two minutes, followed by two minutes of release. In cases 11 and 12 a period of two minutes of compression with 80 mm. of mercury, three minutes release and one minute elevation was employed.

B. *Determinations of Venous Oxygen Saturation.*—In yet unpublished observations, Hick and de Takats [28] studied the effect of various therapeutic measures on the oxygen content and saturation of the femoral vein draining the treated extremity. Some of these observations relate to the behavior of oxygen saturation during treatment with different types of suction apparatus and during continuous and intermittent venous hyperemia. Table 1 presents our results expressed in percentage of saturation of venous oxygen. In all these patients the oxygen capacity and the saturation of the arterial blood were normal. To save space we are presenting only the comparable end results of many determinations, all of which were run in duplicate. Treated with suction apparatus A, the first three individuals maintained their oxygen saturation at twenty minutes fairly well, but after forty minutes an unsaturation is definite, especially in cases 2 and 3. Patients 4 and 5, treated with apparatus B, maintained and even increased their venous oxygen content and saturation.[29] When continuous stasis was produced with 40 mm. of mercury, the figures behaved very similarly to those seen during the use of apparatus A. When intermittent venous compression was produced, with pressures and cycles recently advocated,[22a] similar signs of venous stasis and consequent anoxia appeared. Finally, by prolonging the phase of release and emptying the venocapillary bed by posture, the saturation is fairly maintained in spite of the fact that the venous compression is produced with 80 mm. of mercury.

It seems that with certain types of apparatus, in which long negative and short positive cycles are used, the oxygen debt incurred during the negative phase and due to compression of the thigh is not repaid at the end of treatment. The same condition occurs when a mild continuous stasis is used or if the compression is intermittent, but a thorough emptying of the stagnating blood is not permitted. In all these treatments, a "stagnant anoxia" is produced with lowering of oxygen tension in the tissues. Only the last type of intermittent venous hyperemia effects a repayment of the oxygen debt during treatment.

At first glance one might be led to believe that, with the arterial oxygen content remaining the same, the drop in venous oxygen content and saturation must mean an increased utilization of oxygen in the tissues. This would be true if the rate of blood flow through the capillary bed would remain constant. The contrary is true, however. The blood flow is diminished, since the oxygen consumption must remain nearly constant, yet the arteriovenous oxygen difference is found to increase. This means a lowering of tissue oxygen tension.[10]

We are well aware of the fact that the paucity of data does not permit conclusions; also that certain variable factors make comparable controls very difficult. We wish to present a method by which various therapeutic procedures can be tested. The observations made during a cycle of compression, release and elevation support our previous observations with the recording sphygmotonograph that reactive hyperemia must be given enough time for the full repayment of the oxygen debt.

PRACTICAL APPLICATION OF THE METHOD

Any blood pressure apparatus can be used to produce intermittent venous hyperemia, but a wide, 8 inch cuff, conically shaped to fit the thigh, is preferable as the pressure is distributed over a larger surface and the same amount of pressure that is painful when exerted by a narrow cuff is comfortable. The amount of pressure should not exceed the diastolic pressure of the extremity at that level. It varies between 90 and 60 mm. of mercury in an extremity of which the toes are not edematous, not cyanotic, not ulcerated and not gangrenous. When the foregoing conditions exist, 40 mm.

27. Stürup, C.; Bolton, B.; Williams, D. J., and Carmichael, E. A.: Vasomotor Responses in Hemiplegic Patients, Brain **59**: 456 (Dec.) 1935.
28. Hick, F. K., and de Takats, Geza: The Effect of Sympathetic Ganglionectomy, Alternating Negative and Positive Pressure and Alternating Constriction and Release on the Oxygen-Saturation of Venous Blood, to be published.

29. Patient 6, treated with apparatus C, showed a marked drop of oxygen saturation as early as twenty minutes.

V 10 1937

of mercury should not be exceeded at first, although with later improvement the pressures can be gradually raised. The duration of the venous compression is determined by the appearance of a definite rubor; this occurs in from one to two minutes when pressures of from 60 to 90 mm. of mercury are used. The duration of the release should exceed that of the compression; together with the one minute of elevation, which can be

Fig. 3.—Apparatus in use. For the home, the pulley can be screwed into a door jamb, or a wooden frame can be constructed.

kept constant, it should last twice as long as the compression. Thus two minutes of compression requires four minutes of release, out of which three minutes is in the horizontal position and one minute in the elevated position. The elevation can be active, but it is preferable to lift up the leg with the help of a pulley. Thus in the average case a cycle is completed in six minutes; two minutes compression, three minutes release, and one minute elevation. When the circulatory embarrassment is more pronounced, one minute compression will readily produce a rubor and is followed by one minute release and one minute elevation, a cycle of three minutes.

Ordinarily thirty minutes of this vascular exercise in the morning and thirty minutes in the evening are prescribed. The method is flexible and readily adaptable to the patient's needs. Should it be painful or uncomfortable, either the pressure or the duration of the individual cycle has to be adjusted in order to obtain maximum benefit. When the patient is very sick, a relative or a nurse may inflate and deflate the cuff and lift the leg (fig. 3).

RESULTS

We have selected ten patients from a large group for the study of this method.[29a] These patients were so selected that a close follow up could be instituted and repeated examinations were possible. Our observations are summarized in table 2. We are deeply conscious of the difficulties of evaluating the effects of any form of therapy in peripheral vascular diseases. In the first place, the spontaneous progress, remission and stationary periods, the effects of climate, season and barometric pressure are not within control. Secondly, other forms of therapy that have an established value have been continued, as we did not feel justified in withholding any drug or method that in our past experience has proved helpful. Nevertheless, from our past experience with treatments of different types we regard the intermittent venous hyperemia as a valuable adjunct, an exercise for the home, which can be carried out over a period of months with very little expense and loss of time to the patient.

No results have been obtained in one case of Buerger's disease—and this is in harmony with observations made in our preliminary report on the Herrmann apparatus.[30] The rather striking improvement in our second case of Bueger's disease may be explained by the abstinence from tobacco which was instituted at the same time. Patient 7, with a severe form of arteriolosclerosis with sclerotic but patent major arteries, did get relief from his rest pain. He was, however, immobilized in bed for two weeks with mild continuous heat and received paravertebral alcohol injections. The beneficial effect of rest in bed is so outstanding that we regard it as one of the most important factors in obtaining results. With the exception of this case, however, all other patients were ambulatory, using this exercise morning and evening, before and after work. Patients 1 to 6, suffering from arteriosclerosis or arteriosclerosis with diabetes, have responded favorably. The best result has been obtained in patient 4, a man whom we had the opportunity to observe three times a week for a period of two months, as he took his treatment in the

TABLE 2.—*Observations on the Effect of Intermittent Venous Hyperemia on Peripheral Vascular Diseases*

Case	Age	Diagnosis	Hours of Treatment	Effect on: Coldness and Numbness	Effect on: Claudication	Effect on: Rest Pain	Additional Treatment
1	72	Arteriosclerosis	60	+++	—	—	Theobromine
2	58	Arteriosclerosis	60	—	200 to 300 paces	—	Theobromine
3	62	Arteriosclerosis	60	—	300 to 700 paces	++	Theobromine, aminoacetic acid, vitamin B_1
4	65	Diabetes	40	+++	1½ blocks to 3 miles	—	—
5	61	Diabetes	50	+++	100 to 650 paces	+++	Theobromine, papaverine, phenobarbital
6	56	Diabetes	60	++	150 to 220 paces	—	Theobromine, aminoacetic acid
7	58	Arteriosclerosis	60	—	0	+	Paravertebral nerve block, theobromine, papaverine, phenobarbital
8	45	Buerger's disease	60	0	0	+	Paravertebral alcohol, peripheral nerve section, theobromine
9	25	Buerger's disease	60	—	1 to 8 blocks	—	Abstinence from tobacco
10	42	Postembolic arterial occlusion	344	++	0 to 1½ blocks	..	Paravertebral alcohol, theobromine

Legends: +++ = complete relief, ++ = greatly improved, + = better, 0 = no effect, — = absent at beginning of treatment. Claudication gaged according to ability to walk at a rate of ten paces in five seconds until cramping occurs.

department of physical therapy. His treatment was stopped after forty hours; he was then given an outfit to use in the home.

Our criteria of improvement, as shown in table 2 are purely clinical and only roughly indicate the change in circulation. We have, however, individual instances in

29a. The number of patients who have taken at least sixty hours of treatment has now risen to twenty-five. Our impressions regarding the value of this method have been further confirmed. Favorable results have been obtained in three patients suffering from Buerger's disease, who have had lumbar sympathectomies. As shown in graph III, the effect of stretching of the venocapillary bed is very marked in the sympathectomized limb. As intermittent claudication is a symptom hardly influenced by sympathectomy (The Value of Sympathectomy in Peripheral Vascular Disease, Surgery, to be published), intermittent venous hyperemia seems to be a useful after-treatment for patients who had previously undergone sympathectomy for Buerger's disease.

30. de Takats, Geza: Obliterative Vascular Disease, J. A. M. A. 103: 1920 (Dec. 22) 1934.

which careful studies of the vascular status reveal an increase in collateral reserve. In our present state of knowledge it is not possible to decide just how long these treatments should be continued. But when a certain amount of improvement has been obtained we have discontinued treatment to see whether the results would hold. It seems logical to resume the treatments in periods of stress such as the spring and fall months exert on the vascular system. We have followed this principle for some years in giving typhoid vaccine in Buerger's disease during such seasons. That the summer months afford comparative relief to patients affected by vascular disease is obvious to those who study the attendance at vascular clinics in different months of the year.

A final aspect, namely, the mental outlook of the patients, should not be overlooked. These patients are afraid and truly in danger of losing a toe or a limb;

Fig. 4.—Home made apparatus. Note the double cuffs in use. The pulley is attached to a wooden frame. Note the automatic bell on the wall.

they have already tried different methods with questionable results. They hang their hope on the suction and pressure apparatus, which in our experience has occasionally given relief even when no suction and pressure were applied. The comforting feeling of some definite active form of treatment has been given to them by a short intensive course of treatment, which incidentally keeps them in bed, corrects their diet and permits a thorough study of their vascular status. When they leave the hospital, should this mental crutch be suddenly removed? The home treatment, which we confidently feel has a sound physiologic basis, offers them in addition the possibility to continue in active form a type of exercise which, unless the reserve capacity of the vascular bed is completely exhausted, opens, fills and stretches the venocapillary bed and dilates it as far as it will dilate.

COMMENT

We have been interested in finding a simple and inexpensive substitute for the negative pressure apparatus. Certain advantages of this intermittent venous hyperemia over treatment with alternating suction and pressure are as follows: The treatment (1) can be used at home, at comparatively little cost, far away from medical centers, (2) is therefore available to a larger mass of people, and (3) has a more logical cycle of constriction and release and is readily adaptable to the circulatory embarrassment of the individual patient.

There are obvious disadvantages of this method. It requires an active participation of the patient and cannot be used except with outside help for desperately sick patients, such as we encounter in the acute arterial occlusions. In bilateral lesions, which are so frequently encountered, it necessitates the use of double cuffs with simultaneous elevation of the two lower extremities (fig. 4); this may be cumbersome to some patients. Finally, it may lead to unsupervised self treatment in the home—but this objection is valid for any type of heat, lamp or exercise that may be prescribed for the home.

On the basis of our oscillometric readings and determinations of venous oxygen content and saturation, we suspect that the present cycles used on some of the pressure appliances are not optimal. This is accurately reflected in the diminishing saturation of venous blood with oxygen. On one machine, in which a cycle of 1:1 ratio (even negative and positive cycles) can be produced, the results seem gratifying and the venous oxygen is maintained. It must be remembered, however, that none of these machines produce longer phases than twenty seconds and that the period is scarcely enough to fill and stretch a vascular bed with a normal arterial inflow. In an extremity in which the blood pressure is low and in which the blood flow per minute is cut down to one third or one fourth of the normal, it must take longer to obtain a maximal filling of the minute vessels. Therefore we postulate at least a constriction of one minute to obtain a mechanical stretching of the vascular network, preferably more.

We do not wish to imply that the treatment by alternating negative and positive pressure operates wholly on the basis of intermittent venous hyperemia. There is undoubtedly a partial release from atmospheric pressure of the cutaneous vessels, and this vascular massage of the skin may have reflectoric circulatory effects on deeper structures. But we maintain that there occurs with every phase of suction a marked compression of the thigh and that all the subjective and objective phenomena described as occurring during and after such treatments can be reproduced more simply by alternating constriction and release.[31]

All the contraindications to the treatments by suction and pressure that exist are to be observed in treating patients with intermittent venous hyperemia. They are spreading infection, thrombophlebitis and widespread arteriolar destruction. Because of our comparatively long venous compression from one to two minutes, patients exhibiting venous stasis, cyanosis or gangrene must not be treated with higher than 40 mm. of mercury, as emphasized by Collens and Wilensky.[32a]

One must guard against an attitude of the patient or the attending physician that such a method effects a cure of peripheral vascular disease and that it provides

31. After the completion of this manuscript there appeared an article by Thris and Freeland (Peripheral Circulatory Diseases, J. A. M. A. 107: 1097 [Oct 3] 1936) in which it was stated that alternating positive and negative pressure treatments act by increasing the metabolism of tissues. Their evidence was based on a drop of venous oxygen saturation. Our interpretation of this observation, as outlined in the body of this paper, is the creation of a "stagnant anoxia." The rise in surface temperature observed after such treatments is open to a number of interpretations and is not adequate evidence of increased metabolism.

V 10
1937

new feet for the old. It is just one method of physical therapy to be used in combination with other methods of treatment. Its purpose is to halt the progress or slightly improve a progressive obliterative vascular disease of the peripheral arteries. As one of us emphasized in a preliminary report on alternating suction and pressure therapy,[30] the organic disease, which is usually systemic, will go on and the life expectancy of the limb will depend primarily on the condition of the vessels of the heart, kidney and brain, to mention the most important factors. But a local improvement of collateral circulation brought about by a mechanical phase of stretching the venocapillary bed and a chemical phase of creating an oxygen debt and repaying it with a reactive hyperemia offers subjective relief and occasionally saves a limb from major amputation.

A combination of intermittent venous hyperemia with methods that help to relax constricted vessels seems worth while, especially when vascular spasm is an important factor. We have always maintained that Buerger's disease is not strikingly influenced by alternating pressure therapy. We found the same to be true with regard to the rhythmic compression used intensively in two patients. A possible explanation is that the cuff pressure may provoke and aggravate the vessel spasm (fig. 1, graph V). Following sympathectomy, however, this reflectoric vessel spasm is abolished and the venocapillary bed can be dilated more effectively (fig. 1, graph III). We are now instituting such treatments on Buerger's disease following sympathectomy, unless they are in an active inflammatory stage.

Heat has been used in these patients with great moderation in the form of simple heat cradles. The temperature within the cradle should not exceed 85 F. More heat than this often aggravates pain, speeds up metabolism and calls for more oxygen than the diminished arterial flow can supply.

Vasodilator drugs show in the majority of cases a slight but unmistakable influence. We have little experience with other drugs than theobromine,[32] but this with papaverine and phenobarbital are definitely helpful. In cases of acute arterial occlusion, papaverine is most effective.[33] The general care of patients suffering from peripheral vascular disease has been described elsewhere.[34] Undue emphasis on any one therapeutic procedure, be it medical, surgical or physical, spells, sooner or later, a disillusionment.

SUMMARY

The simple method here described produces intermittent venous hyperemia combined with postural emptying of the venocapillary bed and has an effect on the mechanical filling and stretching of the vascular tree, on the chemical vasodilatation as a result of an oxygen debt, on capillary pressure, on lymph flow and on the saturation of the tissues and the venous blood with oxygen. The method may prove helpful as a home treatment for patients suffering from obliterative vascular disease but should be used in combination with other recognized forms of conservative and surgical therapy. The general cardiovascular status, its progressive or stationary trend, will determine the ultimate result of any local therapy.

122 South Michigan Avenue.

32. Scupham, G. W.: Effect of Theobromine on Peripheral Vascular Disease, Arch. Int. Med. 54: 75 (Nov.) 1930.
33. de Takats, Geza: The Use of Papaverine in Acute Arterial Occlusions, J. A. M. A. 106: 1002 (March 21) 1936.
34. de Takats, Geza: Peripheral Vascular Disease: Its Significance for General Practitioners and Specialists, J. A. M. A. 104: 1463 (April 27) 1935.

HYPOGLYCEMIC THERAPY

REPORT OF EIGHT CASES

H. MASON SMITH, M.D.
TAMPA, FLA.

Publicity in the press and the keen interest of the medical profession regarding reports from European clinics of the remarkable results obtained through the use of hypoglycemic shock therapy in the treatment of dementia praecox caused the Committee on Public Education of the American Psychiatric Association to warn both the public and the profession about this new therapy. As mentioned recently in THE JOURNAL,[1] the public statement was concurred in by all members of the committee and also by the president of the association, Dr. C. Macfie Campbell. In this warning it was stated that the impression that there is no treatment for dementia praecox except through insulin therapy is entirely erroneous and that the insulin shock treatment is being studied in the New York and Massachusetts state hospital systems, in Bellevue Hospital, New York, and in other scientific centers but is not to be undertaken except by those adequately trained to meet its dangers.

Reports [2] of European clinics show that 75 per cent of the patients ill less than half a year are completely recovered as a result of this therapy and that more than 69 per cent of those ill less than a year and a half become productive, socialized individuals able to resume work. Especially does it merit consideration since there is no other treatment for dementia praecox that has proved effectual. Spontaneous recovery occurs in this disease in less than 10 per cent of the cases. The remaining large percentage consists of chronic and incurable patients with a very long expectancy as custodial insane persons, most of whom become charges of the state. In 1934 there were 150,000 of these patients in state hospitals, and 19,149 new patients were committed in 1935.[3]

The hypothesis that Sakel applied successfully in cases of narcotic addiction and with startling results in cases of schizophrenia [4] seems to be applicable also to at least some neuroses. In my practice psychoneurotic patients, some of them problems for years, are responding to this therapy. In the management of neurotic patients, however, the insulin is neutralized before shock occurs, but in cases of schizophrenia the hypoglycemic shock is the criterion or instrument that produces the benefit. As numerous investigators are agreed, it seems that the carbohydrate metabolism of the central nervous system is stimulated by insulin therapy, improved function resulting.

Grave dangers undoubtedly attend the treatment, particularly in the second of the four phases outlined by Sakel.[5] In this period of shock a physician should be in constant attendance, and the attendants should be ready for all emergencies. Emphasis is to be placed on the careful guarding of the circulatory system. There

1. Insulin Shock Treatment for Schizophrenia, Current Comment, J. A. M. A. 108: 560-561 (Feb. 13) 1937.
2. Glueck, Bernard: Hypoglycemic State in Treatment of Schizophrenia, J. A. M. A. 107: 1029-1031 (Sept. 26) 1936; The Induced Hypoglycemic State in the Treatment of the Psychoses, New York State J. Med. 36: 1473 (Oct. 15) 1936.
3. Federal Census Reports for 1934 and 1935.
4. Wortis, Joseph: On the Response of Schizophrenic Subjects to Hypoglycemic Insulin Shock, J. Nerv. & Ment. Dis. 84: 497 (Nov.) 1936.
5. Sakel, Manfred: Zur Methodik der Hypoglykämiebehandlung von Psychosen, Wien. klin. Wchnschr. 49: 1279-1282 (Oct. 16) 1936. Wortis.[4]

is danger of lasting injury to the heart in too great reduction of the sugar content of the blood. In most cases the coma results from the reaction to insulin rather than from the hypoglycemia, and determination of the blood sugar content in the hypoglycemic state is therefore of practically no value in determining the dosage of insulin. Apart from certain guiding principles, the therapy is individual in character, and both the depth of the shock and the number of shocks given depend largely on the intuition and good judgment of the physician in charge.

The variability of the reaction of the individual patient and of different patients to insulin is amazing. Patient 3 of this series walked around the hospital in apparent comfort after receiving a dose of 310 units. In other cases shock followed the administration of 25 units. Patient 1 went into such a deep coma that the administration of dextrose intravenously failed to restore him to consciousness. Usually the accumulation of a thick viscid mucoid saliva offered a problem. In case 2 pneumonia followed aspiration, an ever present danger. The suction machine was used and atropine freely administered in this series of cases. Since epinephrine reduces the shock, it was not used unless a convulsion or a circulatory disturbance was threatened. Arrangements have been made to use bronchoscopic suction with the next patient who aspirates.

The treatment can be carried out successfully in any general hospital that has a good psychopathic ward with a trained personnel of physicians and nurses. Indeed the dangers are more readily avoided and the emergencies more easily met in such an institution than in a psychopathic hospital. Also, treatment in a general hospital obviates the necessity of committing many patients to state institutions, a consideration usually of great importance to the patient's family and of economic significance to the state as well. The following reports of eight unselected cases of psychosis and neurosis show the feasibility of administering this treatment in a well equipped general hospital:

REPORT OF CASES

Case 1.—A truck driver, aged 20, white, was admitted to the Tampa Municipal Hospital Dec. 16, 1936, in a disturbed mental state. He stated that while driving his truck he would be unable to remove his gaze from a house or other object on which it chanced to fall and added that his mind failed to tell him when he was physically fatigued. A good student, he was deeply concerned, he said, about the Bible, which until six months previously he had been unable to understand but now comprehended fully. Not he but the world without was disordered, he felt, and others could tell all that passed through his mind. He grimaced, displayed peculiar mannerisms and gave evidence of emotional poverty. He appeared to be wholly indifferent to his environment. After a night in the hospital he held his neck, believing it injured by gas, with which he thought he had been put to sleep. He also believed that waves of electricity, with which he thought he was being treated, were passing through his body. Except for vagotonia, physical examination was negative.

Anxious to avoid commitment, his family insisted on institution of hypoglycemic shock therapy at once, even though no literature on Sakel's method was as yet procurable. Accordingly the patient, fasting, was given 20, 35 and 55 units of insulin on succeeding mornings without any reaction. The drug was then administered every two hours until he lapsed into coma late on the night of December 24 after receiving 172½ units. Two hours afterward he had an epileptic seizure of eight minutes' duration. He was allowed to remain in the coma for four hours and was normal the next morning. He went home two days later.

After eight days pronounced symptoms returned, and the patient was readmitted to the hospital, Jan. 7, 1937. By the administration of 60 units of insulin at 6 o'clock in the morning and 40 units two hours later, four wet shocks were produced and interrupted without difficulty. Following the fifth shock, however, he remained in the coma. Fifty cc. of 50 per cent dextrose was administered three times at intervals of two hours; epinephrine was given and at one time coramine and caffeine. That night a clonic spasm of forty minutes' duration occurred. After forty hours he came out of the coma in a normal state.

The next day Sakel's original article arrived, and translation revealed how great had been the deviation from his technic in the management of this case. The patient, after being subjected for one week to the polarization phase of Sakel's treatment, was discharged as well, January 24. He is completely rehabilitated, has gained in weight and has returned to work.

Case 2.—An attorney, aged 30, white, admitted to the Tampa Municipal Hospital Jan. 16, 1937, gave a history of nervousness since an attack of influenza eight years before. In August 1933, while in court defending a client for murder, he had experienced his first hallucination in the form of a radio voice talking to him. Shortly afterward, believing he was about to be murdered by a client who had come to his office intoxicated and armed, he had entered into a state of anxious excitement and had finally collapsed. After two months and then ten months in the state hospital, with an intervening six months' period at home, he had come home again only to converse continually with the radio voice and to become threatening and pugnacious, showing homicidal tendencies. He had threatened his mother with knives and had thrown a piano stool at her.

On admission, he was restless, sleepless, irritable, pugnacious and at times noisy. After an initial dose of 20 units of insulin, given the patient fasting at 6 o'clock in the morning, the dosage was increased 5 units daily until a wet shock resulted on administration of 70 units. He had thirty-five shocks, interrupted with Levine feedings until a nasal obstruction prevented, and dextrose was then given intravenously. Following aspiration during the last period of shock, pneumonia developed in the left lung, but he recovered readily. He was discharged March 14.

The patient made a satisfactory social recovery. He is now thoroughly amenable to life at home and is able to do some legal work. Treatment will, however, be resumed in sixty days.

Case 3.—A white man, aged 35, admitted to the Tampa Municipal Hospital Jan. 18, 1937, was the son of a prominent New England physician and the brother of a New York surgeon. He had been a normal boy and an average student. At the age of 16 years a subacute nephritis had developed, which cleared up entirely six years later when mental symptoms developed. At a state hospital in New England his case was diagnosed as dementia praecox of the catatonic type, and during the thirteen years intervening before he came under my observation this diagnosis was repeatedly confirmed elsewhere. Although apparently interested in some things, he had during all these years remained negativistic, catatonic and completely mute.

When admitted to the hospital, he was physically in perfect health and weighed 200 pounds (91 Kg.). He showed advanced catatonic symptoms but had some impulsive and spontaneous movements. In standing, his position was purely statuesque and he never batted an eyelid; but in all public places he would shake his head almost constantly, at first slowly and then rapidly, much as a bull does before charging.

The initial dose of 25 units of insulin, given the patient fasting, was increased each morning, at first by 5 units and then by 10, until after two months he was receiving 310 units without going into shock. Fortunately, 315 units produced a shock, and in all he had twenty shocks. In the preshock stages he talked and at times sang in a rather incoherent way, but with the termination of each shock mutism returned. Even before a complete shock occurred, the psychomotor restlessness ceased. Before he returned to New England, April 10, the rigidity and statuesque appearance were somewhat ameliorated, and he walked with less cataleptic appearance. In this case of thirteen years' duration the patient showed definite benefit.

Case 4.—A white woman, aged 23, admitted to the Tampa Municipal Hospital Jan. 26, 1937, had suffered in infancy from colitis and then from infantile paralysis, as a result of which one leg was shorter than the other. She had neither talked

V 10
1937

nor walked until she was 2½ years of age. From childhood she had been difficult to manage, and she had failed to develop emotionally into a well regulated adult. Nevertheless, she had completed the junior year of high school. For two years she had been running away, having hysterical tantrums and secluding herself in her room for long periods. Growing more and more infantile in demeanor, she had eventually become negativistic and pugnacious. Several times she had attacked her mother, to whom she attached all her difficulties.

To avoid commitment, she was admitted to the hospital and insulin therapy was instituted. The initial dose of 15 units of insulin was gradually increased to 50 units, the amount necessary to produce a shock. In all, she had four shocks, suffering a convulsion during the last one. She showed continuous improvement and was discharged, February 28. Subsequently she continued to improve at home until April 17, when she lapsed into her former condition.

CASE 5.—A white girl, aged 18 years, was admitted to the Tampa Municipal Hospital Feb. 13, 1937. While attending college in Virginia the previous fall she had broken down nervously, complaining of weakness and exhaustion and becoming at times hysterical or depressed. Having recovered, she had come to Florida in January. A few days after her arrival she began screaming, and in response to all questioning she but screamed the louder. After several days she grew quieter but lost interest in everything, remaining uncommunicative and refusing food.

Treatment in the hospital was begun with 15 units of insulin, and the amount was gradually increased to 50 units. Convulsions followed the first three shock doses, but epinephrine stopped this tendency. After the first wet shock she was normal for thirty minutes. She has had twenty-three wet shocks and now remains normal for two hours after each shock. Also she shows a much better reaction during the intervals between the hypoglycemic states. She is still under treatment.

CASE 6.—A cigar maker, white, aged 45, admitted to the Tampa Municipal Hospital March 13, 1937, was physically in perfect health. For a year he had had paranoid delusions with increasing frequency until he had begun to have hallucinations almost constantly. Voices talked about him wherever he went, he said, and when at work he would hear his wife tell him she was "stepping out" with young men every night. Fearing attack, he had been continually looking around while on the cigar bench and had refused to leave the factory at closing time.

He was apprehended and brought to the hospital for treatment. The amount of insulin given him was increased from 20 to 90 units, but the insulin was neutralized before shock occurred. At the end of two weeks all hallucinations had disappeared and the patient was discharged. His behavior has since been normal.

CASE 7.—A WPA worker, white, aged 30, was admitted to the Tampa Municipal Hospital March 27, 1937, in such a cloudy mental state that he could give no history. He had, however, had pneumonia a year previously and had been under great emotional stress for two years, his wife, father and brother having died of influenza. He had become greatly introverted, suffering many subjective sensations. Improper relationship with a woman had caused moral conflict. Found in a state of excitement digging into his wife's grave to see whether she was not dead but merely placed in a pasteboard box as voices had told him, he had been apprehended and transferred next day to the hospital.

On admission he displayed psychomotor restlessness, stared into space when quiet and showed no emotional reaction. Physical examination was negative. Fasting, he was given 15 units of insulin in the morning and after dinner a larger dose at 3 o'clock. The dosage was increased gradually until 50 units, given to the patient fasting, produced coma, which was interrupted within an hour. He improved after the third day and following the coma was normal. The dose was gradually reduced, and he was discharged April 10 as cured. He has gained in weight and returned to work. In this hysterical episode, recovery was effected very rapidly.

CASE 8.—A college boy, white, aged 22, admitted to the Tampa Municipal Hospital March 18, 1937, complained of phobias and depression. The illness had begun a year previously while he was living alone and working his way through college in Ohio. He had begun to fear on leaving home that he had left a cigaret or a match burning. Seeing a bottle of oil of wintergreen while eating pie one day, he had begun to worry about being poisoned. He had become obsessed with the fear that everything he ate was poisoned and that poison got on him as he passed the chemical laboratory daily. Despondent and depressed as the phobias had grown more pronounced, he had had to discontinue his college work.

On admission, he gave no history of other illness and physical examination was negative. The blood sugar level was 144, but there was no reduction with Fehling's solution. Fasting, he was given an initial dose of 15 units of insulin in the morning and a second dose in the afternoon, the dosage being increased by 2½ units each time. He improved steadily during three days spent in the hospital and then returned to Winter Haven, Fla., where Dr. R. E. Gilbert continued the treatment in his office, administering the insulin in increasing doses twice daily and neutralizing it three hours later, keeping the patient meanwhile in his office. Shock was not entered into, but the maximum dose of 50 units caused a considerable degree of reaction. By that time the patient was free from all phobias, the depression had entirely disappeared and his mind was functioning better than it had for years. April 14 he returned to Ohio entirely recovered from the obsessive neurosis.

SUMMARY

Hypoglycemic shock therapy in the treatment of dementia praecox merits exhaustive study. As indicated by the accompanying reports of cases, insulin therapy has proved effectual in treating both psychotic and psychoneurotic patients. In accord with the opinion of numerous investigators, it is here suggested that insulin therapy stimulates the carbohydrate metabolism of the central nervous system.

706 Franklin Street.

AN OUTBREAK OF BOTULISM IN WYOMING

CAUSED BY EATING HOME-CANNED WILD MUSHROOMS

R. B. LINDSAY, M.D.
COKEVILLE, WYO.
J. R. NEWNAM, M.D.
KEMMERER, WYO.
AND
I. C. HALL, PH.D.
DENVER

The possibility of dying after eating certain species of mushrooms is so well known that probably few people partake of these delectable comestibles without harboring at least a subconscious thought that perhaps a mistake has been made in the identification, for which they may pay with their very lives. It is a curious fact that in all the literature on mushroom poisoning summarized by Ford,[1] Damon[2] and Jordan,[3] one finds no reference to outbreaks which might have been due to botulism, and in all the literature on botulism we have found only one outbreak due to mushrooms, although Bachman in 1919 "isolated an organism from home-canned mushrooms which was morphologically and culturally like Clostridium botulinum" and which, "grown in meat, produced a toxin which when fed to chickens produced symptoms similar to limberneck."[4]

From the Department of Bacteriology and Public Health, University of Colorado School of Medicine and Hospitals, Denver.

1. Ford, W. W.: Poisonous Mushrooms, in Peterson, F.; Haines, W. S., and Webster, R. W.: Legal Medicine and Toxicology, ed. 2, Philadelphia, W. B. Saunders Company 2: 817, 1923. Ford, W. W.: New Classification of Mycetismus (Mushroom Poisoning), Tr. Am. Physicians 38: 225, 1923.

2. Damon, S. R.: Food Infections and Food Intoxications, Baltimore, Williams and Wilkins Company, 1928.

3. Jordan, E. O.: Food Poisoning and Food Borne Infections, ed. 2, Chicago, University of Chicago Press, 1931.

4. Bachmann, F. M., and Haynes, E.: Prevalence of Toxin-Producing Anaerobes in Wisconsin, J. Infect. Dis. 34: 132 (Feb.) 1924.

An actual outbreak of human botulism was ascribed to mushrooms by Meyer [5] but a full account was never published. We are indebted to Dr. Meyer for a detailed account of this outbreak, which occurred in 1934 in San Francisco. The mushrooms had been purchased by an Italian family in San Jose, boiled for twenty minutes, placed in Mason jars, covered with olive oil and capped tightly. When opened six months later an "air noise" was noticed. The mother ate some of them before they were cooked and died from botulism in three days; three other members of the family ate them on two different days after they were cooked and suffered no ill effects. Unfortunately, none of the original material was available for laboratory examination, but Dr. Meyer saw the case personally and was satisfied that it was typical botulism, and the connection with the mushrooms was fully established epidemiologically.

Dr. E. C. Dickson of the Stanford University Hospital, San Francisco, who has had a long and extensive experience with botulism, stated in reply to our inquiry that he had never encountered botulism in connection with mushrooms.

Probably one reason for the scarcity of botulism after eating mushrooms is that, although they must frequently harbor the spores of B. botulinus from the soil, they are generally eaten while fresh or after preservation by drying and only rarely after home canning.

THE PRESENT OUTBREAK

The present outbreak occurred in the family of B. R., a rancher living about 5 miles from Cokeville, Wyo.

Thursday afternoon April 9, 1936, one of us (R. B. L.), while on his way by team and sleigh to visit a ranch several miles from Cokeville, was stopped by Mr. R., who lived nearby and requested to call on his return trip as one of Mr. R's children was not feeling well. On returning one hour later at 5 p. m. the father and mother were found to be greatly alarmed at the obviously precarious condition of their little girl, Joyce, aged 2½ years, who was evidently dying from respiratory failure. The pulse was strong and regular but no air was passing into or out of the lungs. Quick examination showed that there was no obstruction of the air passages. Lobeline was administered hypodermically and artificial respiration was attempted. Air passed freely to and from the lungs during artificial respiration but there was no natural respiratory response, and the heart action weakened and ceased in about four minutes. The parents said that the child had been sick only since morning; she had vomited a little and seemed drowsy. They did not think she had any fever.

Another girl, Alidde, aged 5½ years, was lying on the bed apparently unconcerned in what was going on. This naturally aroused suspicion but the now hysterical parents, on being questioned, denied that she was ill. Her pulse was found to be normal but she was staring glassily into space and did not wish to be disturbed; she would not answer questions. She was therefore raised to a sitting posture, whereupon her head dropped forward on her chest; she could not be induced to hold her head up, owing apparently to a definite paralysis of the muscles of the neck, simulating and immediately suggesting the "limberneck" of fowls, which is well known to be a form of botulism.

The parents were then questioned about having eaten home-canned or preserved foods. They first answered in the negative but a neighbor reminded them that they had been eating home-canned mushrooms. Mr. R. admitted this but said that they had been eating them for years and he was sure that they had nothing to do with the illness of his children. Further questioning elicited the fact that they had also been eating, among other things, home-made cheese, commercially canned tomato paste and home-cured sausages. Particular attention was directed to the mushrooms because a small remaining portion appeared to be spoiled. Some of these mushrooms had been served at the evening meal Tuesday April 7, two days before the children became ill. All these foods were saved for examination.

Neither of the parents nor a 4 months old nursing infant showed any symptoms at this time. The infant was taken from the breast and they were advised to bring Alidde at once into the Lincoln County Miner's Hospital 45 miles away at Kemmerer, Wyo., but owing to the poor roads, which were impassable by automobile and difficult even for horses and sleigh, they did not arrive until 3 a. m., April 10.

At this time the sick child was reexamined by two of us (R. B. L. and J. R. N.). She showed marked prostration and was unable to answer questions except by whimpering sounds. She insisted on lying on her right side and when turned on her back began to struggle, gasp and choke. When water was placed in her mouth she was unable to swallow. The pupils were dilated and would not respond to light. There was marked muscular weakness so that she could neither sit up nor support her head when she was raised from the bed. The patellar reflex, however, was practically normal. There was no nausea, vomiting or looseness of the bowels. Examination of the heart, lungs and abdomen gave negative results. The clinical diagnosis of botulism was thus reaffirmed. A high enema and stimulants were administered and botulinus antitoxin was ordered from Denver. This serum was delivered by airplane [6] and had to be dropped at Kemmerer by parachute because there was no landing field, but the child died from respiratory paralysis a short time before, at 3:32 p. m.

Both parents were tested for skin sensitivity to horse serum; Mrs. R., being found not sensitive, was given intramuscularly 50 cc. of botulinus antitoxin (type A, 6,125 units plus type B, 6,125 units). Mr. R., on the contrary, showed a positive skin reaction; several small doses of normal horse serum were administered at hourly intervals, gradually increasing to 10 cc., which gave no reaction. He was then given about 25 cc. of botulinus antitoxin (type A, 3,000 units, type B, 3,000 units), whereupon a marked serum reaction developed, with excessive perspiration, prostration, pulse 120, respiration 30, temperature 96 F. and generalized urticaria. Six minims (0.4 cc.) of epinephrine intravenously checked this reaction.

All the family were kept under close observation for one week. Neither Mrs. R. nor the baby ever showed any symptoms of botulism but Mr. R. complained of slight difficulty in swallowing during the second week, from which he completely recovered.

Subsequent to the outbreak it was learned that the mushrooms grew wild on the R. ranch. They were gathered during the spring of 1935, packed cold in quart glass jars with a little garlic and one teaspoonful of salt to each jar, and then steamed for four hours in a wash boiler.

On opening the mushrooms for use, Mrs. R. poured off the liquor, fried them in butter with tomato paste, garlic and spice, and served them hot. There was no suspicion of spoilage. How long they were heated is not known, but it is thought that they were removed from the fire almost at once; thorough heating would surely have destroyed the toxin.

LABORATORY STUDIES

A small remnant of the home-canned mushrooms was received at the laboratory in Denver, April 13. The contents of this jar were macerated, gassy and sour smelling. Microscopically there were numerous large gram-positive rods, gram-positive cocci and streptococci. The juice was easily filtered through paper and a Mandler filter. This filtrate contained a weak type A toxin of Bacillus botulinus; 3 cc. injected subcutaneously into a 400 Gm. guinea-pig produced the characteristic muscular weakness in forty-eight hours and death in seventy-two hours. This action was prevented by simultaneous injection of the same amount in a second animal with 1 cc. of type A botulinus antitoxin, while type B antitoxin had no preventive effect. These observations confirmed the clinical diagnosis of botulism.

No effort was made to isolate the various aerobic bacteria which were present, but a powerfully toxigenic strain of Bacillus botulinus, type A (No. 9184) was recovered from the mushrooms. One cc. of a dilution of 1:100,000 of a Mandler filtrate

5. Meyer, K. F.: The Frequency of Botulism, California & West. Med. 44:388 (May) 1936.

6. Dr. A. A. Hermann of Denver, the Denver Post, and Governor Edwin Johnson of Colorado, cooperated in providing the serum and in its delivery by airplane.

V 10 1937

prepared from a four day dextrose broth culture of this strain of B. botulinus injected subcutaneously killed a 250 Gm. guinea-pig in less than forty-eight hours with typical symptoms of botulism.

This raised the questions as to whether B. botulinus is capable of producing strong toxin in experimentally canned mushrooms and whether associated staphylococci or streptococci may interfere with toxin production. Fresh commercial mushrooms (Agaricus campestris) were rinsed, boiled ten minutes to destroy the tyrosinase and so prevent discoloration. They were then chopped fine, covered with water and a thin layer of vas-par in 250 cc. Erlenmeyer flasks half full, and sterilized in the autoclave at 120 C. for twenty minutes. Just before inoculation they were steamed in the Arnold sterilizer for twenty minutes.

Three such flasks of experimentally "canned mushrooms" were inoculated by gently displacing the vas-par seals. Each flask was inoculated with B. botulinus No. 9184 (type A) from the aforementioned outbreak, a 5 day old culture being used in deep brain medium suspended in sterile water and boiled for two minutes to destroy toxin and vegetative rods. A portion of this suspension was filtered through a Berkefeld filter before heating; 1 cc. of this filtrate killed a 450 Gm. guinea-pig with symptoms of botulism over night. Portions of the same filtrate boiled only one minute and two minutes (94 C.) failed in doses of 1 cc. to produce symptoms in five days in inoculated guinea-pigs. These controls insured that no preformed toxin was inoculated into the flasks of "canned mushrooms." One flask received no further inoculation; a second flask received in addition to B. botulinus a heavy inoculation of Micrococcus aureus, while a third flask received one of Streptococcus pyogenes. The upset vas-par seals were quickly reset by cautious melting with the Bunsen flame.

They were incubated at 37 C. Gas production started on the second day and continued vigorously throughout the entire period of incubation of seven days. When opened, all the flasks emitted a foul rotten odor. Aerobic subcultures on blood agar slants failed to show any unintended contaminations, but the inoculated staphylococci and streptococci were easily recovered. The fluid portions of all the flasks were easily filtered, yielding clear light brown filtrates.

Each of these filtrates was shown to contain approximately 10,000 minimum lethal doses of botulinus toxin per cubic centimeter by appropriate tests on guinea-pigs weighing from 525 to 600 Gm., thus proving that experimentally "canned mushrooms" provide a suitable nutritive pabulum for growth and production of a powerful toxin by B. botulinus and that the associated presence of Micrococcus aureus or Streptococcus pyogenes does not interfere with the formation of such toxin. We are unable to explain the weak toxin found in the home-canned mushrooms.

About twenty minutes after the death of the second child, a specimen of blood had been drawn. This was saved and was subsequently forwarded to the laboratory in Denver, where it was received April 15.

Both aerobic and anaerobic cultures made from this blood were sterile and a small guinea-pig inoculated with 1 cc. subcutaneously failed to show any symptoms. We have never been able to demonstrate botulinus toxin in the blood taken post mortem, but Glasmann[7] succeeded repeatedly in our laboratory in demonstrating the toxin in extracts from the livers of animals that died from experimental botulism. This method has never been adequately tested as a means of postmortem diagnosis in human beings but should be tried whenever possible.

COMMENT

It is noteworthy that the possibility of mushroom poisoning in this outbreak was not even considered, botulism having been correctly diagnosed almost at once from the clinical signs.

It may be considered, however, that possibilities exist for clinical confusion of botulism and mushroom poisoning (mycetismus). First of all, the onset of symptoms in botulism only rarely occurs earlier than twelve hours after ingestion of the toxin, and the symptoms in order of appearance are diplopia and dilatation of the pupils of the eyes with dimness of vision, vertigo, aphonia, muscular weakness, dysuria, constipation, salivation due to strangulation, and respiratory failure. Nausea, abdominal cramps and vomiting occur occasionally,[8] but diarrhea rarely if ever occurs. Terminal convulsions may be observed occasionally but never early in the disease. Patients suffering from botulism generally remain conscious until a few seconds before they die, and the heart is often observed to beat a few seconds after respiration ceases, as in the present instances. The mortality is high, between 60 and 80 per cent.

Mycetismus may be discussed briefly under five headings, as proposed by Ford.[1]

In mycetismus gastro-intestinalis caused by certain species of Lactarius, Entoloma and Lepiota, all the symptoms are limited to nausea, abdominal cramps of variable intensity, vomiting and diarrhea. Neural symptoms never occur, and the mortality is low. There is no danger of confusion with botulism, but similar symptoms might be caused by other forms of food poisoning, notably those due to staphylococci, Bacterium paratyphosum or Bacterium enteritidis.

In mycetismus choleriformis, which is caused by Amanita phalloides and probably also by Pholiota autumnalis and Hygrophorus conicus, the onset is generally characterized in from ten to fifteen hours by violent abdominal cramps, nausea, vomiting and diarrhea, rapidly followed by loss of strength, the appearance of casts in the urine due to damaged kidneys, and heart failure. Liver function is also impaired. The mortality is high, about 50 per cent. Neural symptoms are absent and there is little danger of confusion with botulism.

In mycetismus nervosus, which is due to those mushrooms containing muscarin, such as Amanita muscaria, Amanita pantherina and certain species of Inocybe and Clitocybe, violent gastro-intestinal symptoms may appear within two or three hours, accompanied by contracted pupils, profuse perspiration and salivation, localized or generalized convulsions, delirium, hallucinations and death in coma with acute dilatation of the heart. Unless treated early with atropine, the mortality is high. There is little danger of confusion with botulism.

In mycetismus sanguinareus, caused by Helvella esculenta, the outstanding symptoms are hemoglobinuria and abdominal distress followed by a mild persistant jaundice. The mortality is low and confusion with botulism should never occur.

The last form of mushroom poisoning, mycetismus cerebralis, caused by certain species of Panaeolus, is possibly the only one likely to be confused with botulism because of the disturbances of vision and the staggering gait. However, the earlier onset, from four to five hours, the exhilarating intoxication and the low mortality should serve clearly to distinguish it from botulism.

SUMMARY

In an outbreak of botulism, type A, due to home-canned wild mushrooms of unknown species in Wyoming, two children died but the parents were saved, probably by the accident of a weak toxin and the timely prophylactic administration of botulinus antitoxin.

7. Glasmann, V. E.: The Postmortem Diagnosis of Botulism, University of Colorado Studies **20**: 36, 1932.

8. Hall, I. C., and Gilbert, O. M.: A Survey of Botulism in Colorado with a Discussion of Recent Outbreaks, Colorado Med. **20**: 233 (July) 1929. Hall, I. C.: Further Outbreaks of Botulism in the Rocky Mountain Region, Am. J. Hyg. **17**: 235 (Jan.) 1933; New Outbreaks of Botulism in Western United States, Food Research **1**: 171 (March-April) 1936.

This is believed to be only the second outbreak of botulism caused by home-canned mushrooms and the first in which both the toxin and the bacillus were demonstrated by laboratory procedures.

In spite of the comparatively weak toxin, a strongly toxigenic strain of B. botulinus type A was recovered from the mushrooms, and both pure cultures and cultures of this mixed with Micrococcus aureus and Streptococcus pyogenes produced normally potent botulinus toxin.

A brief comparative summary of the differential symptoms of botulism and mushroom poisoning (mycetismus) indicates that these conditions need never be confused clinically.

4200 East Ninth Avenue.

ENCYSTED TRICHINAE

THEIR INCIDENCE IN A PRIVATE PRACTICE AND THE BEARING OF THIS ON THE INTERPRETATION OF DIAGNOSTIC TESTS

THOMAS B. MAGATH, M.D.
ROCHESTER, MINN.

Ever since those days when the early anatomists dulled their scalpels on the calcified cysts of trichinae in the muscles of cadavers, trichinosis has been a more common disease of man than generally has been recognized. Just how common it is in North America is not known but recent literature indicates that it is of far more frequent occurrence than most physicians have realized. In the United States many physicians apparently have thought that federal meat inspection regulations protected citizens, but there is evidence that critical evaluation of the actual effect of these regulations has been lacking. It is perhaps not sufficiently realized that only a part of the hogs consumed in the United States are killed in supervised abattoirs [1] and that the regulations do not provide for microscopic examination of the tissues of hogs.[2] Further, it may not be generally known that somewhere from 3 to 6 per cent of hogs are infected with trichinae.

The incidence of human infection with trichinae is still not known. The clinical diagnosis is attended with difficulty and great inaccuracy. Hall [3] has collected more than forty diseases with which trichinosis has been confused and recently Otto and Janney [4] have reported an outbreak in a family in which diagnoses including typhoid, influenza, encephalitis, mumps and acute alcoholism were erroneously made. At present the only basis for establishing the incidence of the infection is that founded on examination after death. Unfortunately there have been but few such studies; a summary of these is given in table 1.

In addition to these studies Osler [5] recorded that in 1,000 postmortem examinations performed by him in and about Baltimore he casually observed trichinae six times, and Mallory [5] observed them twice without microscopic examination in 1,103 postmortem examinations done in Boston.

The exact method of examination is important, since the results will be influenced by it. It is fairly clearly established that the muscles of the thorax and neck are more likely to be invaded than other muscles; hence, these should be examined. Gross observation is almost valueless, since cysts will not be seen unless they are heavily impregnated with calcium and are present in large numbers. Sectioning will reveal but a small percentage. Queen [6] found that, if large numbers of sections which have been specially prepared are studied, one can detect trichinae in only about a fourth of the muscle specimens in which the worms are actually present. A much better and easier method is to examine muscle in a compress with a low power objective. According to the care used and the amount of tissue employed, a fair number of trichinae will be discovered. Queen found 38 per cent positive by using two fields, 4 by 6 cm. If larger and more fields are examined, the increase in positives will be somewhat proportional. If large amounts of muscle are digested and the larvae extracted, more muscle may be used and more trichinae will be found. It may be safely stated, therefore, that the reported incidence of infection with trichinae is much lower than was actually present and was somewhere in the neighborhood of from 15 to 20 per cent. This is ample proof that citizens of the United States frequently eat raw or undercooked pork.

Of great significance is the observation that statistics from Europe, especially Germany, a country generally believed to exhibit a high incidence of trichinosis, indicate a much lower incidence of infection among bodies examined at necropsy or on the dissecting tables than in the United States. Indeed, if the surveys made in Germany are to be compared with those made in the United States, one would conclude that the incidence is about five times greater in the United States than in middle Europe.

The next question is whether the samples examined are representative of the population of today. It is evident that among the observations reported are only five made in the last thirty-five years and that those have come from charity hospitals and dissecting rooms and from only a few regions of the country. Only one survey was made in the northwestern part of the United States and that was of bodies found on the anatomic dissecting tables. With the exception of a few cadavers in St. Louis, a larger series in Minneapolis, a few hospital postmortem examinations made in Denver and one series in San Francisco, no studies have been made west of Buffalo except in New Orleans, and this is the only record from the entire South. Cadavers cannot be considered representative of the population.[7] They

From the Division of Clinical Pathology, Section on Parasitology, the Mayo Clinic.

1. Under bureau inspection 28,506,019 swine were slaughtered in the last fiscal year. No one knows the number slaughtered other than under bureau supervision.

2. The following embrace the essential regulations governing the inspection of hog meat: The regulations governing the meat inspection of the United States Department of Agriculture require that no article of a kind prepared customarily to be eaten without cooking shall contain any muscle tissue of pork unless the pork has been subjected to a temperature or other treatment prescribed by the chief of the bureau, sufficient to destroy all live trichinae. All parts of the muscle tissue of pork shall be subjected to heat at a temperature not lower than 137 F., or shall be refrigerated at a temperature not higher than 5 F., for a continuous period of not less than twenty days, or shall be treated by curing as hereinafter prescribed. The pork or the articles of which it is an ingredient, after chilling or preliminary freezing, shall be stored in freezers maintained during the twenty-day period at a temperature not higher than 5 F. If the meat is stored in tierces it is necessary to make a sufficient allowance of time, namely, ten days, for the temperature of the meat in the center of the tierces to drop to the required level. Several methods of curing such meat as hams and pork butts intended to be used without cooking are also prescribed. These methods vary somewhat according to the size of the pieces of meat, whether they are ground or whole. The amount of curing ingredients and how such ingredients are to be applied, as well as the time and temperature, are also regulated. No deviation from prescribed methods is permitted.

3. Hall, M. C.: Personal communication to the author.

4. Otto, G. F., and Janney, J. H., Jr.: A Study of Trichinosis in a Maryland Family, Am. J. Hyg. **25**:76-85 (Jan.) 1937.

5. Quoted by Williams.

6. Queen, F. B.: The Prevalence of Human Infection with Trichinella Spiralis, J. Parasitol. **18**:128 (Dec.) 1931.

7. Hall and Collins (Studies on Trichinosis: I. The Incidence of Trichinosis as Indicated by Postmortem Examination of 300 Diaphragms, J. Parasitol. **22**:532-533 [Dec.] 1936) thought the cadavers were representative of the general population. If they were, they differed markedly from cadavers coming into the dissecting rooms in institutions with which I am familiar.

V 10 1937

represent those who are down and out, who live from hand to mouth and of necessity eat inferior and poorly prepared food of all sorts. In addition, they represent persons who are much older than the general population and frequently they are foreign born.

Patients from the charity hospitals are also not altogether typical of the population, since large numbers are foreign born and they too have lived, at least in the past, below the standard usually considered typically American.

With the hope of shedding some light on this matter I examined muscles from bodies of 220 patients of the Mayo Clinic who had died of various causes. While

It is impossible to give figures that would be indicative of the frequency of clinical trichinosis in this country. Until 1898 the diagnosis had been made in something like 900 cases and since then hundreds of cases have been observed. It is evident that in some cases the diagnosis has been trichinosis when actually the disease was not present and many persons infected with trichinae have never been given a diagnosis of trichinosis. It may be concluded, therefore, that clinical trichinosis is actually relatively common in the United States.

Unfortunately, there are few or no facts on which to base a true estimate of the infection among hogs.

TABLE 1.—*Summary of Reports of Examinations Made for Trichinae After Death*

Year	Author	Place	Number of Necropsies	Infected		Method of Examination
				Number	Per Cent	
1881	Glazier, quoted by Williams	Newark, N. J.	100	1	1	
1881	Glazier	New York	150	3	2	Necropsy; muscles examined microscopically
1881	Glazier	Philadelphia	40	1	2.5	
1901	Wheipley, quoted by Williams	St. Louis	20	1	5	Cadavers, microscopic examination
1894	Thornbury, quoted by Williams	Buffalo	21	3	14.3	Cadavers, microscopic examination
1901	Williams: J. M. Res. 6:64 (July) 1901	Buffalo, Philadelphia Baltimore, Denver	505	27	5.3	Necropsy, pressed out bits of muscle examined microscopically
1931	Queen [4]	Rochester, N. Y.	344	59	17.5	Digestion of 50 Gm. of diaphragm
1931	Queen	Boston	59	16	27.6	
1904	Riley and Scheiffey: J. A. M. A. 102:1217 (April 16) 1904	Minneapolis	117	20	17.9	Cadavers, muscles compressed
1956	Hinman: New Orleans M. & S. J. 88:445 (Jan.) 1956	New Orleans	200	7	3.5	Digestion of 2 inches square of diaphragm
1906	Hall and Collins [5]	Washington and Baltimore	300	41	13.7	Cadavers, compression and digestion
1956	McNaught and Anderson: J. A. M. A. 107:1446 (Oct. 31) 1956	San Francisco	200	48	24	Digestion of 50 Gm. of diaphragm
Total			2,055	227	11.0	

these patients had come from various states, most were from the North and the Middle West. They had been for the most part well to do but were not selected in any way. They died in 1935 or 1936. Almost all were adults. Pieces of the following muscles were procured: diaphgram, intercostal muscles, rectus abdominis and sternocleidomastoid. About 2 Gm. of each was compressed and searched with a binocular microscope equipped to magnify 25 times.

The results are seen in table 2, in which is recorded the degree of infection in the seventeen bodies (8 per cent of the total examined) in which trichinae were found.

It can be seen that although the diaphragm contained more trichinae than other muscles it was not always found to be involved in these examinations. A summary of cases can be had in table 3. It can be seen that symptoms suggestive of a history of infection were present in only seven, but in these the symptoms were readily explained on the basis of other conditions found. History of muscular pains is commonly enough given by persons in whose muscles trichinae are not found. Unfortunately, eosinophil counts were made in only five cases, but in these there was little to suggest infection. In short, the evidence here, as in the series reported by others, indicates that although infection with trichinae is common enough it is frequently, perhaps more often than not, subclinical in intensity and may not produce persistent eosinophilia. On the other hand, many cases of clinical trichinosis go undiagnosed.

In the light of previous work and from the observation that the infection of the persons whose bodies were examined by me was light, it seems safe to assume that, had the examinations included digestion or microscopic examination of from 50 to 100 Gm. of muscle, more larvae would have been found; therefore, the actual incidence of infection can be fairly safely assumed to have been of the order of 12 to 15 per cent.

Bushnell [8] said that the incidence was 1.95 among hogs inspected from 1898 to 1906, but recent figures are not available. It is assumed that at present from 2 to 4 per cent of hogs in the United States are infected. Hence it is impossible to estimate the exposure to which the population really is subjected. Even the method by which hogs are infected is not clear. Recently it has been generally thought that rats and mice probably act

TABLE 2.—*Number of Trichinae Found in 2 Gm. Samples of Various Muscles, in Examination of 220 Bodies*

Body	Diaphragm	Intercostal Muscles	Sternocleidomastoid	Rectus Abdominis
1	—	—	3	3
2	1	0	2	1
3	0	0	6	0
4	0	0	1	0
5	0	0	1	0
6	3	0	0	0
7	1	0	—	1
8	3	3	1	0
9	5	3	2	1
10	0	1	1	0
11	0	0	0	1
12	2	2	0	1
13	0	0	0	1
14	2	0	0	0
15	0	0	0	1
16	1	1	0	0
17	2	—	0	1
Total	20	10	17	11
Average per 100 Gm. of muscle	63	33	54	32

as reservoirs and infecting agents, since hogs eat these rodents. Examination of rats in slaughter houses has revealed that large numbers are infected, and those in sewers of cities are even more heavily infected. It is not clear, however, just what part these animals play in the general disseminating of the disease among hogs raised in the rural districts.

8. Bushnell, W. F.: Trichinosis as a Public Health Problem, Journal-Lancet 55:42-46 (Jan. 1) 1935.

Since introduction of the skin test and precipitin test for the diagnosis of trichinosis, great increase in interest in the disease has been manifest. More specific knowledge of the significance of the tests is urgently needed. It is reasonably certain that in the presence of acute or even chronic trichinosis the tests give a high percentage of positive cutaneous reactions, but the proper dilution of the antigen to use is not established. Friedlander [9] criticized Kilduffe [10] for using a dilution of 1:100 and pointed out that the test was more specific when higher dilutions were employed. It has been suggested that the dilution should be 1:10,000 for detecting acute cases. McCoy, Miller and Friedlander [11] obtained 70 per cent positive reactions in thirty-six early cases at this dilution and 92 per cent positive reactions at a dilution of 1:500. Spink and Augustine [12] in thirty-four tests found thirty-three positive with a dilution of 1:10,000 but it is not clear that in all cases bona fide trichinosis was present; at least the parasite was not found in all the sections taken for biopsy. Drake, Hawkes and Warren [13] made tests in twenty-six cases in which a clinical diagnosis of trichinosis had been made and obtained positive results with a dilution of 1:10,000. Augustine and Theiler [14] found positive reactions at this dilution in nine of ten cases, but Heathman's [15] experience was not so favorable. She tested forty-four patients and obtained a positive response in only 50 per cent with a dilution of 1:100 and only 12.3 per cent with a dilution of 1:6,000 and 1:500. The precipitin test gave 68.2 per cent positive reactions in thirty cases. Kaljus [16] tested sixty-six persons who had early trichinosis and found 74 per cent positive skin tests with dilutions of 1:1,000 and 1:2,000.

The great difficulty with the skin test is the lack of observations on which to establish its value when the result is negative and lack of knowledge concerning the incidence of positive reactions it gives in the general population. McCoy, Miller and Friedlander found that of 104 so-called controls in Rochester, N. Y., 9 per cent gave positive skin reactions with dilutions of 1:10,000 and 18 per cent gave positive results with a dilution of 1:5,000; of forty-seven controls tested in San Francisco, 4 per cent gave positive reactions with a dilution of 1:10,000 and 6.5 per cent with a dilution of 1:500. In Louisiana of ninety-two persons tested, all infected with the whipworm, 18 per cent gave positive results with a dilution of 1:10,000 and 62 per cent with a dilution of 1:500. Augustine and Theiler found that, of forty Columbians tested, twenty-eight (70 per cent) gave positive skin tests with a dilution of 1:100; even with a dilution of 1:500 an equal number were positive. Kaljus found only 5 per cent "false" positives in testing 109 controls, using dilutions of from 1:1,000 to 1:2,000. He stated that the presence of whipworms did not influence the test.

From these observations it would appear that the skin test is usually positive in acute trichinosis even when the antigen is used in high dilutions, and evidence indicates that years after acute infection a positive skin test still persists, but for how long, and how sensitive the skin remains to the antigen, is unknown. If infection is as common as microscopic examination indicates that it is, the test should be positive more frequently than evidence shows it to be and if the test does reveal light and long-standing infections, its interpretation when positive must be made with great caution. This suggests that in many cases in which a diagnosis of trichinosis is made on the basis of skin tests, and without biopsy, it may not be correct. Recently I saw a patient who had muscle pains, fever and an eosinophilia which at first was 14 per cent. The eosinophils increased to 21.5 per cent after ten days, and edema of the face and hands developed. A skin test with a dilution of antigen of 1:5,000 gave a slightly positive reaction, yet a liberal specimen of pectoral muscle, carefully examined, failed to reveal the presence of trichinae. The eosinophilia disappeared as rapidly as it had risen. The diagnosis of trichinosis had to be withdrawn.

Eosinophilia, especially rapidly increasing eosinophilia, is of extreme importance and probably is more important than skin tests. If a positive skin reaction is present at a dilution of antigen of 1:10,000, if eosinophilia is more than 10 per cent and is increasing, and if clinical symptoms of trichinosis are present, including fever, transverse facial edema and muscular pain, the evidence is certain enough to justify the clinical diagnosis of trichinosis.

TABLE 3.—*Clinical Data Concerning the Same Persons as Those Represented in Table 2*

Patient	Age	Sex	Residence	Occupation	Eosinophils, per Cent	Suggestive History	Diagnosis
1	84	♀	Minnesota	Housewife	1.5-8.0	Pain in muscles and joints	Pernicious anemia, arthritis
2	83	♀	Minnesota	Housewife	...	.....	Arteriosclerosis, bronchiectasis
3	68	♂	Iowa, California	Hotel owner	...	Pains in muscles	Arteriosclerosis, myasthenia gravis
4	41	♀	South Dakota	Housewife	...	.....	Leiomyoma of uterus, bronchopneumonia
5	66	♂	Ontario	Salesman	2.5	.....	Carcinoma of colon, chronic ulcerative colitis
6	69	♂	Minnesota	Farmer	...	.....	Trauma of head
7	60	♂	Minnesota	Laborer	...	Lumbar pains	Trauma of chest
8	32	♀	Iowa, Minnesota	Housewife	...	Rheumatic fever at 21 yrs.	Rheumatic heart, pulmonary infarcts
9	57	♀	New York	Housewife	...	Pain in shoulders	Cholecystitis with stones
10	21	♀	Manitoba	Stenographer	0	Pain in left leg	Subacute pericarditis, bronchopneumonia
11	33	♂	Italy, Wisconsin	Dentist	0.5	.....	Carcinoma of rectosigmoid
12	42	♂	Arkansas	Bookkeeper	...	.....	Meningioma
13	56	♂	Oklahoma	Well driller	...	.....	Hypertensive heart
14	27	♀	Minnesota	Housewife	0	.....	Pneumonia
15	47	♂	Minnesota	Laborer	...	.....	Traumatic injuries
16	57	♀	Illinois	Housewife	...	Rheumatic fever at 19 yrs.	Adenomatous goiter
17	75	♂	Minnesota	In asylum	...	.....	Carcinoma of lung

SUMMARY

Although this is the only recorded series of microscopic examinations made on a relatively large number of unselected patients in private practice, it is clear that

9. Friedlander, R. D.: The Present Status of the Diagnostic Intradermal Test for Human Trichiniasis, Am. J. M. Sc. **188**: 121-123 (July) 1934.

10. Kilduffe, R. A.: The Bachman Intradermal Reaction in Human Trichinosis, Am. J. M. Sc. **186**: 802-808 (Dec.) 1933.

11. McCoy, O. R.; Miller, J. J., Jr., and Friedlander, R. D.: The Use of an Intradermal Test in the Diagnosis of Trichiniasis, J. Immunol. **34**: 1-23 (Jan.) 1933.

12. Spink, W. W., and Augustine, D. L.: The Diagnosis of Trichinosis with Especial Reference to Skin and Precipitin Tests, J. A. M. A. **104**: 1801-1805 (May 18) 1935.

13. Drake, E. G.; Hawkes, R. S., and Warren, Mortimer: An Epidemic of Trichinosis in Maine, J. A. M. A. **105**: 1340-1343 (Oct. 26) 1935.

14. Augustine, D. L., and Theiler, Hans: Precipitin and Skin Tests as Aids in Diagnosing Trichinosis, Parasitology **24**: 60-86 (March) 1932.

15. Heathman, Lucy S.: Laboratory Diagnosis in Trichinosis, Am. J. Hyg. **23**: 397-409 (March) 1936.

16. Kaljus, W. A.: On the Practical Value of the Intradermal Reaction with the Trichinelliasis Antigen for the Diagnosis of Trichinelliasis in Man, Puerto Rico J. Pub. Health & Trop. Med. **11**: 768-790 (June) 1936.

V 10
1937

they, although perhaps not so frequently infected with trichinae as are patients from economically lower walks of life, nevertheless often harbor the parasite. Exposure must be common.

From available knowledge it is evident that, in the United States, from 10 to 20 per cent of the adult population have acquired trichinae. Although some of these persons have experienced more or less typical symptoms of trichinosis, most of them never have had any signs suggestive of the infection having taken place. This makes interpretation of the skin and precipitin tests difficult, since it is not known whether immunity follows mild or even severe infection with this parasite.

Eosinophilia of more than 10 per cent, and especially rapidly rising eosinophilia, should suggest trichinosis. If, in addition, the skin test is positive in a dilution of antigen of 1:10,000, if a history of eating undercooked pork is obtained, and if typical symptoms are present, the diagnosis would appear almost certain. The final proof must still remain the demonstration of the worms in the body of the victim.

In spite of the fact that trichinosis has not received widespread consideration in the United States, one must conclude, on the basis of studies already made, that it is one of the major public health problems in this country and that there is still need of emphasizing the importance of cooking pork thoroughly before it is consumed.

HOW LARGE IS THE HYPERPLASTIC PROSTATE?

REPORT OF THE LARGEST HYPERTROPHIED PROSTATE EVER SURGICALLY REMOVED

RICHARD P. MIDDLETON, M.D.
SALT LAKE CITY

There is no clinical problem concerning which one may find a wider divergence of opinion among competent urologic surgeons at present than that of the applicability of transurethral resection to various types of obstructing prostates. At one extreme are those who assert that transurethral methods are properly applied only for sclerosis of the bladder neck (median bar) and prostatic carcinoma. At the other end of the gamut is a group, many of whose members are fortified by abundant experience, who claim to be able to resect successfully any prostatic obstruction that will permit passage of the resectoscope into the bladder.

Whatever may be the ultimate outcome of this divergence of opinion, the question at issue has lent practical value to a consideration of the actual size attained by the hyperplastic prostate. The early writers on the subject of transurethral prostatic resection were captivated with the idea that the removal of a very small amount of tissue would suffice—a mere nibbling at the lobes, or "cutting a groove" from the trigon down to the verumontanum. Growing experience, with its painful lessons afforded by incomplete results, has convinced those who persist with transurethral resection that uniform success can be achieved only by the removal of a considerable portion of the hyperplastic mass. Hence it is pertinent to inquire how much tissue the resectionist can remove through the urethra and what relationship this amount bears to that which remains.

Cunningham's "Text-Book of Anatomy" [1] describes the size of the normal prostate in terms of dimensions, with no mention of weight. "Gray's Anatomy" [2] says of the normal prostate, "Its weight is about 8 Gm." This is curiously at variance with several other authorities consulted. Keyes,[3] for example, gives the weight as from "16 to 24 grams" and Hinman [4] says: "The normal gland weighs about 23 Gm. The average enlargement will not exceed 85 Gm., even the larger specimens weighing well under 200."

As regards the size attained by hyperplastic obstructing prostates, Alcock [5] remarks in a summary of his experience with transurethral resection:

> How much does the average hypertrophied prostate that is removed surgically actually weigh? These prostates vary greatly in size. A gland the size of a golf ball weighs 43 Gm., one the size of a hen's egg weighs 51 Gm., one the size of a lemon weighs 140 Gm., and one the size of an orange weighs 314 Gm. In the records of my own prostatectomies the weight of the gland removed was recorded in each of 433 cases; the largest was 270 Gm. and the average weight of the 433 was 38.3 Gm. Therefore, if with the resectoscope one removes from 15 to 35 Gm., one is removing a very large part of the average gland. In 85 per cent of the first hundred cases that I did by the resection method I removed less than 10 Gm. of tissue; in the last hundred—the eighth hundred—more than 10 Gm. was removed in 90 per cent of the cases, and in only 2 per cent was less than 5 Gm. removed. I know from my experience that it is absolutely essential to remove an adequate amount of tissue and I find as my experience has grown that I am removing larger and larger amounts of the gland. The largest amount removed at one sitting was 54 Gm.; the largest amount removed from one patient was 134 Gm. in three sittings. In the bulk of the cases now being done, from 15 to 35 Gm. is removed. . . . In general it may be said that from one third to three fourths of the gland is removed.

Emmett [6] recently reported the transurethral removal of 112 Gm. of tissue from an "enormous prostate gland" of high vascularity. The operation was carried out in two stages, the bleeding being markedly reduced at the second operation by intraprostatic injection of solution of posterior pituitary.

The following case report is noteworthy because it concerns, as far as can be determined, the largest hypertrophied prostate that has ever been surgically removed and the second largest prostate on record in the world's literature:

> G. A. M., a retired farmer, aged 72, of Swedish ancestry, was seen first March 13, 1936, in consultation with his family physician. The patient was in acute urinary retention and had been brought to the hospital when efforts to catheterize him at home had been unavailing.
>
> During the preceding ten years the patient had noticed gradually increasing frequency, nocturia, urgency, and diminishing caliber of the urinary stream. From time to time there was some dysuria. For about a year he had been obliged to catheterize himself occasionally. Although this sometimes caused mild bleeding, he never before had failed to insert the catheter into the bladder. His general health remained fairly good, except for the usual disabilities of his age. Aside from the urinary difficulty his only complaint was of a mild chronic cough.
>
> His past medical history was uneventful, with no serious illnesses. His wife and seven children were living and well. The family history was irrelevant as far as any tendency to prostatism was concerned. His father died at 80 of "old age."
>
> At the time of admission to the hospital the patient, who was well developed and reasonably well nourished, was badly dehydrated and complained bitterly of distress from a full bladder.

1. Cunningham's Text-Book of Anatomy, ed. 6, New York, Oxford University Press, 1931, pp. 1279-1282.

2. Gray's Anatomy, ed. 22, Philadelphia, Lea & Febiger, 1930, p. 1245.

3. Keyes, E. L.: Urology, New York, D. Appleton & Co., 1928, p. 226.

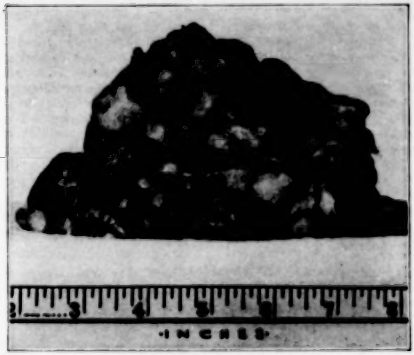
4. Hinman, Frank: The Principles and Practice of Urology, Philadelphia, W. B. Saunders Company, 1935, p. 871.

5. Alcock, N. G.: Prostatic Hypertrophy, J. A. M. A. **104**: 734-738 (March 2) 1935.

6. Emmett, J. L.: Preoperative Intraprostatic Injection of Pituitrin in Transurethral Resection: Preliminary Report, Proc. Staff Meet., Mayo Clin. **11**: 619-622 (Sept. 23) 1936.

A marked arcus senilis was present. The pupils were equal and reacted to light. Hearing was moderately impaired. The teeth were artificial. There was no adenopathy. The chest was moderately emphysematous, with reduced expansion and hyperresonant percussion note. There were no râles. The heart was not enlarged. Its rhythm was regular and there were no murmurs. The heart tones were somewhat distant. The blood pressure was 135 mm. of mercury systolic, 85 diastolic. Abdominal inspection and palpation revealed a tense tender tumor attributable to fulness of the bladder. The extremities were normal except for moderate arteriosclerosis. The external genitalia were normal. Rectal palpation disclosed a huge benign prostatic hypertrophy, which bulged so prominently that the examining finger was deflected sharply backward into the hollow of the sacrum. The upper border of the gland seemed far beyond the finger's reach. The consistency and contour were suggestive of benign hyperplasia, with no indication of malignancy. The great size of the tumor did, however, momentarily raise the question of prostatic sarcoma.

After several attempts with various catheters, the patient was relieved of 600 cc. of retained urine by passing a filiform to which was screwed an 18 French Phillips woven catheter.



Fragmented prostate weighing 557 Gm. (largest surgical specimen on record). One pound avoirdupois contains 453.6 Gm. Many of these pieces are as big as the typical large operative specimen. Photograph made four days after operation, when the specimen had shrunken considerably.

The catheter had to be passed until its whole length disappeared into the urethra before urine was drawn. There was slight bleeding.

The following morning suprapubic cystotomy was carried out under local anesthesia supplemented with a small amount of ethylene. The patient's condition was not particularly good, but the great difficulty of catheterization made immediate intervention imperative. When the bladder was opened an enormous mound of prostatic hypertrophy was encountered rising high into the vesical cavity so as practically to fill the bladder. Its consistency was smooth and elastic. The internal urethral orifice was stretched between the immense lateral lobes to form an anteroposterior slit long enough to admit all the fingers of one's hand. The mammoth gland seemed to fill the true pelvis like the head of a fetus at term. There were no palpable stones, vesical neoplasms or diverticula. A Pezzer catheter was inserted into the bladder and a small empty Penrose drain was left in the space of Retzius.

Two weeks later the patient's condition seemed well stabilized. Values for blood urea nitrogen and creatinine had become normal and the phenolsulfonphthalein excretion was 35 per cent, about equally divided between the first and second hours. Enucleation of the prostate was performed March 28, 1936, under spinal anesthesia with 100 mg. of procaine. The prostate was so tightly jammed in the pelvis as to make the ordinary peripheral cleavage plane inaccessible. It was therefore removed by morcellation, which was effected digitally through the many natural cleavage planes afforded by the hyperplastic spheroids. The resulting heap of chunks of tissue (many as large as the typical operative specimen) appeared sufficient to fill a man's hat. Bleeding was only moderate. A large-size Pilcher bag was placed in the prostatic cavity, but the fit was like that of an egg in a bowl. The remainder of the cavity was filled with two large gauze packs. The incision was closed with interrupted silkworm gut sutures penetrating all layers and several sutures of chromic catgut.

The day after operation, there being no evidence of fresh bleeding, the gauze packs and Pilcher bag were removed. The urethral tube of the bag was utilized to draw a 20 French soft rubber catheter into position, after which the incision was allowed to heal. During convalescence the bladder was irrigated several times daily through the urethral catheter with sterile physiologic solution of sodium chloride. Except for moderate febrile reaction the patient made a smooth recovery, and there was very little spill of urine through the incision after the first two days. Fourteen days after operation the catheter was removed and the patient voided without leakage through the wound. He was discharged from the hospital April 20, 1936.

At the present time the patient is in excellent health and has normal urinary function, with a large free stream and perfect control. Cystoscopic examination three months after operation showed that the huge prostatic cavity had been almost completely effaced, with restoration of the original anatomic relationships at the vesical neck.

The prostatic tissue was examined by Dr. L. L. Daines, dean and professor of pathology at the University of Utah Medical School. His report reads:

"Specimen consists of many masses of prostatic tissue, the largest measuring 7 by 6 by 4 cm. Together, the masses weigh 557 Gm. (almost 1¼ pounds). There are many well defined rounded tumor-like masses and also flat fibrous masses.

"Microscopic sections show a benign, moderately cystic prostatic hyperplasia. There is no evidence of malignancy in these sections."

COMMENT

This is the largest prostate ever removed surgically. The only larger gland described in medical literature was that reported by Douglas,[7] which weighed 673 Gm. In his case, however, the patient failed to survive a suprapubic cystotomy and the prostate was obtained and studied at autopsy. Freyer [8] of England in 1908 removed a prostate weighing 529 Gm., which was the largest surgical specimen previous to the present case. His patient survived and obtained a satisfactory functional result. Freyer was accustomed to remove the largest prostates in one piece and, in another case in which the prostate was almost as big, describes graphically his struggle to encompass the entire mass and work his way down to the apex of the prostate. Such immense prostates fill the pelvis so completely that it seems to me much more simple and gentle to utilize the many natural cleavage planes between the hyperplastic spheroids and remove the mass piecemeal, as was done in the case reported. This method has the additional advantage of permitting delivery of the largest prostate through a small incision. It might be compared with Kelly's [9] suggestion that the uterus be deliberately split in certain difficult hysterectomies.

SUMMARY

A prostate weighing 557 Gm. was removed from a patient, aged 72 (largest surgical specimen on record). This enormous prostate was almost a pound (avoirdupois) heavier than the greatest mass of tissue ever removed transurethrally up to now, even with multiple operations. Deliberate fragmentation of huge prostates is suggested as the easiest, safest method of operation.

Boston Building.

7. Douglas, H. L.: Case Report of Enormous Prostatic Adenoma, J. Urol. 18: 115-120 (July) 1927.
8. Freyer, P. J.: Clinical Lectures on Enlargement of the Prostate, ed. 5, New York, William Wood & Co., 1920, pp. 90-92 and pp. 86-88.
9. Kelly, H. A.: Gynecology, New York, D. Appleton & Co., 1928, p. 437.

V 10
1937

Clinical Notes, Suggestions and New Instruments

ELECTRICALLY OPERATED BURNER AND BACTERIAL LOOP

SOL ROY ROSENTHAL, M.D., PH.D., CHICAGO

The instrument[1] shown in the illustration will perform all the duties of a Bunsen burner and bacterial loop. It is adaptable to the private office as well as to the general laboratory.

THE APPARATUS

The apparatus consists of a removable holder and loop and a burner set in a stand. The holder and loop are held in position by two posts, which fit corresponding sockets in the stand. When in place, the chrome wire of the loop as well as the stem of the holder is automatically heated. The burner is composed

Apparatus showing removable holder and loop at right and burner at left.

of chrome wire wound on a lava spool and held at an angle to correspond with the inclination of the mouth of test tubes when passed over these coils.

METHOD OF OPERATION

For heating solutions in a test tube (urine, Benedict's solution, and the like) the latter is simply rolled over the coils. Five cubic centimeters of distilled water will boil in forty seconds. Larger amounts of water can be heated over the burner as with a flame.

For bacteriologic work the holder is withdrawn and the regular bacteriologic technic is followed, except that flaming the mouth of containers is activated by passing them close to (at 1 to 4 mm. about burner temperature is beyond 365 C., the highest register of thermometer used) or actually grazing the coils. The holder is returned to its place and is there automatically reheated.

COMMENT

By actual use in the laboratory, the instrument described has been found to qualify for the normal functions in a clinical and bacteriologic laboratory. Its advantages are:

1. It may be used more widely, since it operates from the ordinary electrical outlet.
2. It heats solutions in test tubes more gradually and thus is ideal for the ordinary urine examinations.
3. It saves time in bacteriologic work, since the loop is always ready for use (estimated at 50 per cent minimum).
4. It is silent.

1853 West Polk Street.

1. Model by E. H. Sargent & Co. Patent applied for.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

PAUL NICHOLAS LEECH, Secretary.

ERGONOVINE

Correspondence of the Council on Pharmacy and Chemistry with Sir Henry Dale

At its annual meeting in 1936, the Council proposed the name Ergonovine as a nonproprietary designation for the new ergot alkaloid which had been termed "Ergotocin" by Kharasch, "Ergometrine" by Dudley and Moir, "Ergobasine" by Stoll, and "Ergostetrine" by Thompson. In connection with the discussion of the Council action, Sir Henry Dale of London, England, who was at that time a Corresponding Member of the Council, wrote a letter stating to the Council his opposition to the adoption of the name Ergonovine. Before the letter of Sir Henry was received the Council had adopted the name. Sir Henry was informed of this and the following correspondence between Sir Henry and the Council ensued:

Letter from Sir Henry Dale of Oct. 22, 1936:

"My attention has been so fully occupied with other matters during the past few months, that I have not found time hitherto to give to your letter of June 1st, written with the authority of the Council on Pharmacy and Chemistry, the considered reply which it required. I will ask you to convey my apologies to the Council for this unavoidable delay. From my own point of view it has a certain advantage, in enabling me to feel sure that I write in no hasty mood of resentment, but after long and careful consideration, which has not modified my view of that action by the Council which formed the subject of our correspondence. Let me, very briefly, summarize the relevant points and the principal stages of this correspondence.

"I have for a number of years been a corresponding member of the Council on Pharmacy and Chemistry. I have welcomed the implied confidence in my knowledge of and judgment in such matters as might come within the sphere of the Council's action. I have held myself ready to give to the Council, if requested, any information or opinion which might be helpful to them in the discharge of their duties. They have courteously forwarded to me, for my confidential information, the regular type-written Bulletins of their discussions and decisions. On receiving the Bulletin of February 26th of this year, I observed that notice had been given of the question whether the Council should adopt a nonproprietary name for the new ergot alkaloid. My interest in this matter might be supposed to be known to some members of the Council, and it seemed possible that they might think fit to consult me more directly upon it. To minimize the loss of time in transatlantic correspondence, I wrote spontaneously to the Council on March 16th, as soon as the matter came to my notice through the Bulletin. My association with those who had given the alkaloid the name Ergometrine made it proper that my communication, though it was as fair and judicial as I could make it, should be treated as an *ex parte* statement. I asked the Council to regard it as such, and urged them, before considering the matter, to obtain similar statements from others, who had claimed the right to name what all had admitted to be the same alkaloid. I felt bound, further, to urge, that, after carefully considering the claims of the four names already current,

the Council should choose one of them for adoption in New and Nonofficial Remedies, and that they should not add to the existing confusion by introducing yet another name of their invention. Later I learned that the action, which I had thus deprecated in advance, had been taken by the Council on March 17th, the day after my letter was written, and long before it could reach them. It was evident that they had taken this step without communication with any of those who had made claims to the first published description of the alkaloid. Such first published description would, I think, be accepted by scientific convention in all countries, as giving the only right to bestowal on such a substance of the name to be adopted for scientific use, provided only that the name is made generally available, and not restricted in use by trade mark. I accordingly held, and still hold, the view that, in simply ignoring all such claims of prior nomenclature, and in assuming to themselves the right to impose on the medical world of America a new name of their own invention, without consultation with any of those who were properly concerned, the Council were guilty of, at least, a serious scientific discourtesy.

"In publishing their decision the Council stated that they had rejected all the names proposed by the claimants to discovery, on the ground that they were either subject to proprietary rights or objectionably suggestive of therapeutic use. Since the particular name in which I was interested, Ergometrine, could not be under any suspicion as regards proprietary protection, it had to be assumed that it was regarded by the Council as violating their rule against therapeutic suggestion. I wrote to the Council on April 20th to express my opinion of their action; and unwisely, I think, argued at some length against the decision that Ergometrine was therapeutically suggestive, and Ergonovine free from this objection. This argument has led the Council to justify their decision in detail, and has probably helped to divert their attention from the really important grounds of my objection to their action. These are two.

"1. They justify their action by the statement that 'there are almost insensible gradations between "Antirheumatic Compound," "Antifebrin" and "Ascorbic Acid."' I suppose that one must accept the Council's evidence as to the limits of their own ability to draw such a distinction; but I am bound to say that it seems clear enough to me. I am glad that the Council mention 'Ascorbic Acid,' since it provides a less complicated example of the policy, which I criticized in the case of the new ergot alkaloid. In both these cases, men of science were seeking to isolate and to identify constituents of natural materials, the existence of which was known only by specific and therapeutically important actions—in the one case, the prevention or cure of scurvy, in the other the action for which ergot had been used for centuries, viz., the stimulation of the human uterus to activity when the drug was given by the mouth. In each case, the essential discovery did not consist merely in the isolation of a hitherto unknown chemical substance, but in its experimental identification as *the* substance responsible for a specific action; for preventing or curing scurvy, in the one case, and for producing the traditional effect of orally administered ergot on the human uterus, in the other case. It seems to me that names such as Ascorbic Acid and Ergometrine were not only permissible, but even desirable in these circumstances, as a reminder that these substances were not merely of chemical interest, but owed their identification and their scientific interest chiefly to the specific biological activities which these names indicated. Are the Council, then, preparing to use their power of embargo against the name 'Progesterone,' accepted internationally for the pure luteal hormone by the different experts responsible for its isolation? And at what stage are we to expect the rigid application of their principles to the various antisera and vaccines, the accepted names for which flaunt, in plain English, the suggestion of their therapeutic uses, each for a particular disease or type of infection? 'Ascorbic acid' or 'Ergometrine' we are told, must be excluded on the principle which rejects 'Antirheumatic mixture'; while 'Antidysenteric serum,' to quote only one of a very long list, passes without question. If an antitoxin, identified by its specific action, were to be isolated as a chemically pure substance, would its name become improperly suggestive? It does not seem to me that the Council's action is justified by a rigid application of any intelligible principles.

"2. My most serious complaint, however, was not of the lack of consistency in the Council's action, but of their assumption of the right to make and to give effect to decisions, which cut right across the accepted rules of scientific nomenclature, without even consulting those whose proper right and interests would thus be affected. The right of a discoverer of a new substance to name it has a wider authority and recognition than any principles which the Council may lay down for themselves. I suggested, in an earlier letter, that their infringement of this right, without any kind of communication with its possessor, involved a scientific discourtesy. They reply, in effect, that it is the discoverer who is to blame for any injury or annoyance he has sustained, in that he did not obtain their approval, *before exercising his own unquestionable right.* Lest there should be any doubt about this suggestion, I quote the actual words from the letter which you wrote to me on June 1st, with the Council's express authority. 'This interpretation, or misinterpretation, of the Council's motives often could be avoided if the Council were given the opportunity to examine new names for their compliance with its rules, before these names were released to the medical public.' The subject of our correspondence was the Council's action with regard to scientific names, properly given to new substances by their discoverers. The Council suggest, as a protection for the discoverer against their invasion of his rights, that he should approach them like a manufacturer wishing to advertise a nostrum in the United States of America, and wondering how near to the wind of the Council's regulations, well known to him, he will be allowed to sail. The Council have instanced the case of Ascorbic Acid. Do they really feel entitled to assume that Professor Szent-Györgyi, or any other foreign savant, has ever heard of their rules, or even of their existence?

"It seems to me that the Council's attempt thus to extend their authority is quite intolerable, quite apart from the manner in which they exercised it. That part of their proper function which is concerned with nomenclature, deals with the misuse of names in the commercial exploitation of remedies, in the interests of particular businesses. The Council have done work of immense value in curbing the nuisance due to the misleading trick of inventing multiple trade names for a single well-known remedy; they have properly refused their approval to proprietary preparations labeled so as to indicate, not their true nature, but a therapeutic action which the proprietor wishes to suggest. But what concern have such practices with the proper naming of newly isolated pure substances—vitamins, alkaloids, or hormones—in a manner conveniently identifying them with the specific actions which led to their recognition, and which give them their chief interest? It is the attempt to act consistently, in thus applying their policy outside the proper range of their authority, that has led the Council into an attitude of such arrogant assumption, quite foreign, I am sure, to their individual natures.

"In the circumstances, there is only one proper course left to me, namely, with the greatest respect for their aims, to ask the Council to accept my resignation from the position of Corresponding Member, on account of my strong disapproval of their interpretation of their authority. In so doing I should like to thank the Council for the privilege I have had so long, of following their important activities through their confidential Bulletin. I should like to ask one parting favor, and to make one parting recommendation. I should be grateful, and I believe it would help them, by eliciting the comments of others than myself, if they thought it proper to give publicity to this letter through THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION."

V 1
193

Letter to Sir Henry Dale of Jan. 26, 1937:

"Your letter of October 22 in reply to the communication from the Council of June 1 was transmitted in full to the Council for its consideration.

"The Council voted (1) that your communication be submitted to the Editor of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION for his consideration with a view to publication; (2) that the following reply of the Council also be submitted to the Editor with a view to its appearance in THE JOURNAL with your letter of October 22. The Council further voted to await your comments on its reply before submitting both communications to the Editor of THE JOURNAL.

"The statement authorized by the Council as a reply to your letter of October 22 is as follows:

"Sir Henry Dale's letter concludes his correspondence with the Council regarding the naming of the new ergot alkaloid. It may be recalled that this alkaloid was discovered independently and practically concurrently by four groups of workers, and that each group had proposed a different name for this substance. The Council found that each of these names was in conflict with the published Rules of the Council, and that none of these could be accepted without nullifying the rules under which the Council had worked for these many years, and which it had applied impartially to numerous other cases. The Council therefore used the privilege which it has reserved under its published procedure and coined a name 'Ergonovine,' with the hope that this would prove acceptable to the medical public. Indeed the Council had some hope that the discoverers of the alkaloid would also see the advantages of this name. The Council did not correspond with these discoverers in advance, chiefly because it did not believe that this would do any good, since it had reason to believe that the discoverers were already familiar with these rules when they framed the conflicting names. Sir Henry Dale, who is identified with one of the groups, considers this a serious scientific discourtesy. The Council regrets that Sir Henry views its actions in this light and assures him that no discourtesy was intended. It had not occurred to any one in the Council that they would be so interpreted. Apparently it had not occurred to Sir Henry himself, in analogous cases; for instance, with Viosterol. As corresponding member of the Council, all discussions and decisions of the Council were mailed to him, just as they are to the regular members, as well as the printed Rules and Explanatory Comments in New and Nonofficial Remedies; and the Council would have been glad to receive his views on this as on all subjects. In the absence of any dissent on his part, either as to the Rule or the procedure, up to this time, his present reaction came as a distinct surprise.

"The most serious part of the letter is the assertion that the Council has no moral right to censor names applied by the discoverer. Sir Henry writes: 'The right of a discoverer of a new substance to name it has a wider authority and recognition than any principles which the Council may lay down for themselves' and 'Such first published description would, I think, be accepted by scientific convention in all countries, as giving the only right to bestowal on such a substance of the name to be adopted for scientific use, provided only that the name is made generally available, and not restricted in use by trade mark.' The last clause contradicts what precedes, or rather it indicates that Sir Henry is assuming a universal agreement with his point of view, which does not seem to exist. Such names as 'Adrenalin' and 'Insulin' have been widely accepted by scientists, although they *are* trademarked; and the pharmacopeias, as well as the Council, have coined names whenever this appeared to them to be to the public interest. It may be assumed that the discoverer has also given thought to the public interest, but any one who believes that he has erred in this seems to have a moral right to endeavor to correct the error, so far as he may; and for bodies, such as the Council, which are appointed for the purpose of protecting the public interest, this right becomes a duty. The final arbiter is the public itself, especially in the case of the Council, which has considerable moral responsibility, but no power of dictating to the public. It may indeed happen that the interests of different sections of the public differ in degree or in kind, and in such case it is possible that one name may be employed in preference by chemists, and another by physicians.

"Sir Henry feels that there is something sinister or humiliating in the Council's offer 'to examine new names for their compliance with its rules, before these names were released to the medical public.' The first words of the quotation 'This interpretation or misinterpretation of the Council's motives could often be avoided' shows that the Council had not thought of imposing humiliating conditions on the discoverer but was seeking the discoverer's cooperation in protecting the Council against the imputation of pedantry, and the public against needless polemics. At the same time, the Council feels that it would be ruinous to discriminate in the applications of its rules, and that the manufacturer has a moral right to demand that whatever rules are adopted, they be applied impartially to all the products that come to the Council. The Council doubts seriously whether scientists themselves profit in the end by a different treatment.

"Sir Henry also believes that therapeutically suggestive names are not only permissible but desirable when the substance is 'responsible for a specific action.' One difficulty in such suggestions is that of drawing a line, especially if the action of Ergometrine were considered as 'specific.' Sir Henry asks some pertinent questions about other names, which he considers inconsistent with the Council's interpretation of its rules. To these it may be replied in general that the Council has not felt called on to combat names which had become firmly established before its own Rules were adopted, and that these Rules themselves, and their interpretations, have undergone progressive development. The Council does not propose to change the name of 'morphine,' which has been in use over a hundred years; it has not even proposed to change the name of 'narcotine,' although this has become misleading; it accepted the names 'diuretin' and 'urotropin' because they were in use before the Council was established; it accepted a few other names, which are somewhat suggestive of therapeutic use, at a time when it was thought possible to draw arbitrary lines between 'more and less,' which experience has shown to be impractical; it may have accepted a name or two without recognizing their significance; but all these are not good reasons for framing and accepting new names with therapeutic suggestions.

"The answer to Sir Henry's question as to the acceptance of the name 'Antidysenteric Serum' has been tersely explained in the Rules of the Council for many years: 'The prohibition against therapeutically suggestive names is not applied to serums, vaccines and antitoxins, because the accepted nomenclature of the specific organisms used in their preparation makes this unavoidable and because self medication with them is improbable.'

"The endocrine glands, which elaborate a number of principles, do constitute a difficult problem, because the action is often the only feature by which the specific principles can be identified and differentiated, if several are present. The Council has therefore believed it advisable in the interest of avoiding confusion to accept names which imply these actions; for instance, 'androsterone,' 'estrone,' 'progesterone,' provided they are not framed as therapeutic indications. This exemption cannot be applied to the new ergot alkaloid, for Dr. Dale himself showed long ago that this is not the only ergot principle which acts on the uterus. In conclusion, it may be added that the examples which Sir Henry cites, and the difficulties which they present, are but a few of the large number which the Council endeavors to solve to the best of its ability, not by isolated instances, but with a view to the entire problem.

"The members of the Council regret that Sir Henry does not see some of these problems in the same light, especially since our ideals are fundamentally identical. Although he has ceased to be a member, we trust that he will continue to feel free at all times to discuss with the Council any matters of mutual interest."

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SATURDAY, JUNE 5, 1937

THE RHYTHM OF HUMAN FERTILITY

Recent evidence indicating that the actual union of sperm and egg in the human species is possible only for a period of less than twenty-four hours in any menstrual cycle has stimulated tremendous interest in the possible practical applications of this apparently biologic fact. The principal corollary, according to Willson [1] in a review of this subject, is that intercourse, in order to be fertile, must take place not more than twenty-four hours preceding the actual occurrence of ovulation. This view is revolutionary and runs counter to the conclusions drawn from the more or less continuous sexual activity of man and the primates as opposed to lower animals. Furthermore, it conflicts with the previous understanding of the biologic analogies of human menstruation. Clearly, according to Willson, the biologic classification of human beings lends credence to the available clinical and laboratory evidence which points to the same midcycle timing of ovulation that exists in other primates.

The observations of Hartman, however, on the rhesus monkey, in which the time of ovulation appears to be independent of the length of the menstrual cycle, would make the unqualified acceptance of some of the practical applications of this theory rather premature at this time. At present, no practicable method or methods exist for exactly timing ovulation. Should such tests be devised, however, as Willson says, "it will require a seer to cast the horoscope of the epoch of social, economic and moral change upon the threshold of which humanity now stands!" It seems certain that the great majority of women are incapable subjectively of even approximating the time of ovulation. Until this can be done by them, or for them by appropriate laboratory tests yet to be devised, this vital date must be estimated by the physician. In the present state of knowledge it seems wise in the attempted determination of the date of ovulation to allow two days before and two days after the theoretical date. This results in placing its occurrence somewhere in a five day period covering inclusively the twelfth to the sixteenth day before the beginning of the next menstrual period. It is necessary to add two days before the twelfth to cover the term of functional activity of the sperm and one day after the sixteenth to allow for the death of the egg. The period of possible fertility is further lengthened in most women by the fact that the menstrual cycle is likely to vary at least a few days in either direction. Thus, assuming a cycle varying between twenty-six and thirty days (actually few will be found more regular than this) the theoretical date of ovulation using the shortest cycle of twenty-six days may be estimated at the twelfth day after the day the last period began. Four additional days before this must be allowed: two for possible occurrence of early ovulation and two to cover the span of viability of the sperm. This calculation places the first day of the possible fertile period on the eighth day after menstruation. If the patient were regular with a twenty-six day cycle, this day, the eighth, would be the first of a fertile period of eight days, made up of the four days previous to the theoretical day of ovulation, the day of ovulation itself, two days after this to allow for late ovulation, and one additional day to allow for death of the egg. In view of the irregularity of the cycle, however, the difference of four in this instance is now added to the eight days originally figured to make a total of twelve, the number of days of the possible fertile period in this particular patient. Practically then, as Willson points out, the average woman with a maximum irregularity of five days who follows this method of birth control must observe a fertile period of thirteen days which, in addition to the days of menstruation, makes her incapacitated for marital relations for eighteen days in each menstrual cycle. Put in another way, this woman must be continent for about 234 days in each year, as against sixty-five days necessary for the one who is using adequate modern contraceptive measures.

No final conclusions can be drawn from the data thus far available. Willson, however, cites some personal impressions which seem noteworthy. The "safe period" he states, when determined by a competent physician or intelligent layman on reliable menstrual data, is believed to be as reliable as any other known method of contraception. It is, however, unpractical for a considerable proportion of women and unworkable for some and is therefore in no sense a uniformly satisfactory method. Because of the prolonged periods of continence necessary, it tends to destroy spontaneity in marriage to the extent that it forces sexual relations contrary to the normal physiologic tides of desire; in this respect it is antisocial and will tend to destroy rather than to promote marriage. It is obviously unsatisfactory from the standpoint of venereal prophylaxis. Until such time as its limits can be much narrowed and its exact timing more accurately determined,

1. Willson, Prentiss: Present Knowledge on the Rhythm of Human Fertility, M. Ann. District of Columbia 6:187 (April) 1937.

V 10
1937

it can be considered legitimately only as a method accessory and complementary to ordinary methods of contraception. The "safe period" then, used in that way, and also as a guide in the prevention or cure of sterility, is a valuable and practical addition to medical knowledge.

BENZEDRINE SULFATE "PEP PILLS"

Since the advent of ephedrine in modern therapy, a number of similar vasoconstrictors have been proposed primarily for their use in rhinology. Benzedrine, one of this group, has been accepted by the Council on Pharmacy and Chemistry.[1] Benzedrine, as well as its carbonate, differs from other vasoconstrictors which are used for this purpose in being volatile and effective by inhalation.[2] During the past year a nonvolatile salt of benzedrine—the sulfate—has been introduced and has been extensively exploited as a stimulant for the brain and a producer of sleeplessness. This promotion followed exaggeration in newspaper accounts of the results of experiments made with the drug in psychologic investigations.

The inhalation of benzedrine for its vasoconstrictor action occasionally resulted in sleeplessness after overdosage. This action led to its use [3] and later to the use of the sulfate [4] orally for the treatment of narcolepsy and postencephalitic parkinsonism. The sulfate has also been used rather extensively in psychopathic institutions for its effect on fatigue and mood [5] in certain types of mental cases. The latter studies, along with certain attempts to evaluate the mental stimulation resulting from its use in normal persons,[6] came to the attention of the general public. Subsequently some tablets of the sulfate were used in the department of psychology at the University of Minnesota for the purpose of determining its effect in mental efficiency tests. It was noted that the drug prevented sleepiness and "pepped up" the person who was fatigued. Apparently this information was disseminated to the student body by word of mouth and the drug has been and still is being obtained by the students from drug stores for the purpose of avoiding sleep and fatigue when preparing for examinations. Previously caffeine and coffee have been used for the purpose of staying awake during examination periods. Benzedrine sulfate, however, has a greater potential danger because it is more effective and produces many side actions which are not likely to follow the use of caffeine.

The eradication of fatigue and the stimulation of mental activity cannot be produced for any appreciable period without subsequent periods of retribution. Whipping a tired horse is an inefficient practice. Cases of collapse, fainting and insomnia have been reported to the student health physicians. Dr. Ruth Boynton [7] issued a warning in the *Minnesota Daily* against the use of this drug by students, who refer to them as "pep pills" and, according to *Time*,[8] deans and officials of other colleges are finding it necessary to issue similar warnings. Recently the *Minnesota Daily*,[9] in commenting on the situation editorially, stated in part:

> The growing concern of medical men over increasing use of the stimulant is reflected in an item in the current issue of *Time* magazine. There the drug is termed "poisonous," although most physicians are not willing to go so far in condemnation. All of them, however, are unanimous in condemning indiscriminate and unsupervised use.

Benzedrine differs primarily from other sympathomimetic amines that are used primarily for their vasoconstrictor actions in the extent of its ability to produce certain effects on mood and fatigue. These differences make it especially important that the drug be used only under a physician's direction. There is as little excuse for employing it to avoid fatigue and sleepiness during a temporary period of stress and strain as there is for using morphine to produce sleep after that period is over. The approaching final examinations in universities and schools suggest that physicians in a position to do so issue warnings of the danger of employing the drug in this manner. The druggist too has an opportunity to demonstrate his cooperation with the medical profession by refusing to sell the item except on prescription. Unfortunately, at one of the university cities where the drug has been obtained it has been purchased principally from the drug stores of a large national chain whose owners are apparently more interested in the immediate profit than in the ultimate effects on the purchaser. The manufacturers, on the other hand, appear to be anxious not to have the drug fall into disrepute through misuse, since it has been presented for consideration by the Council on Pharmacy and Chemistry of the American Medical Association.

Benzedrine sulfate thus becomes one more example of a drug which is useful in a limited field of therapeutics but which has been diverted to uncontrolled use by the public for related, but not similar, purposes. If the situation is to be remedied, and it certainly must be as soon as possible, the manufacturer, the druggist, the student health authorities, the college officials and

1. Benzedrine, J. A. M. A. **101**: 1315 (Oct. 21) 1933.
2. Bertolet, J. A.: Benzyl Methyl Carbinamine Carbonate, M. J. & Rec. **136**: 75 (July 20) 1932. Byrne, H. V.: The Use of Benzyl-Methyl-Carbinamine Carbonate in the Treatment of Rhinitis, New England J. Med. **209**: 1048 (Nov. 23) 1933. Wood, E. L.: A New Drug for the Treatment of Eustachian Tube and Middle Ear, Arch. Otolaryng. **21**: 588 (May) 1935. Scarano, J. A.: Rapidity of Shrinkage and Immediate and Secondary Reactions following Local Applications of Ephedrine and Benzedrine, M. Rec. **140**: 602 (Dec. 5) 1934.
3. Uhlrich, Helmuth; Trapp, C. E., and Vidgoff, Ben: The Treatment of Narcolepsy with Benzedrine Sulfate, Ann. Int. Med. **9**: 1213 (March) 1936.
4. Prinzmetal, Myron, and Bloomberg, Wilfred: The Use of Benzedrine for the Treatment of Narcolepsy, J. A. M. A. **105**: 2051 (Dec. 21) 1935. Solomon, Philip; Mitchell, Roger S., and Prinzmetal, Myron: The Use of Benzedrine Sulfate in Postencephalitic Parkinsonism, J. A. M. A. **108**: 1765 (May 22) 1937.
5. Myerson, Abraham: Effect of Benzedrine Sulfate on Mood and Fatigue in Normal and in Neurotic Persons, Arch. Neurol. & Psychiat. **36**: 816 (Oct.) 1936. Peoples, S. A., and Guttmann, Erich: Hypertension Produced with Benzedrine: Its Psychological Accompaniments, Lancet **1**: 1107 (May 16) 1936. Davidoff, E., and Reifenstein, Edward C., Jr.: The Stimulating Action of Benzedrine Sulfate, J. A. M. A. **108**: 1770 (May 22) 1937.
6. Nathanson, M. H.: The Central Action of Beta-Aminopropylbenzene (Benzedrine) Sulfate, J. A. M. A. **108**: 528 (Feb. 13) 1937. Sargant, William, and Blackburn, J. M.: The Effect of Benzedrine on Intelligence Scores, Lancet **2**: 1385 (Dec. 12) 1936.
7. Minnesota Daily, March 12, 1937, p. 3.
8. Time, May 10, 1937, p. 45.
9. Minnesota Daily, May 11, 1937, p. 2.

the physicians must cooperate in preventing the use of this drug by students, who through ignorance may be harming themselves, at least temporarily. It is chiefly the ignorant who try such self medication, not realizing that a drug can never substitute for knowledge or intellect. The drug is too new to pharmacology and experimental medicine to warrant any prediction as to possible permanent harm that may result from its continued misuse.

This drug is one of a group which is contraindicated in certain circulatory conditions, especially hypertension. Some persons have an idiosyncrasy to the drug, which makes its use by them inadvisable. Thus far the reports of difficulties encountered with the drug have arisen from two midwestern campuses. Physicians may well keep this drug in mind when encountering cases of fainting, exhaustion and collapse.

A PROPOSED MEDICAL EXAMINER SYSTEM FOR MICHIGAN

In 1877 Massachusetts abolished the office of coroner and replaced it with the office of medical examiner. The law authorized two full time, salaried medical examiners for Suffolk County, in which Boston is situated, and in each of the other counties as many part time examiners on a fee basis as the county commissioners might deem necessary. In such counties the number varies from one to eleven. The office is appointive, the term of service being seven years. Repeated reappointment of the medical examiners of Boston has resulted in a high type of medicolegal investigation not approached in any coroner jurisdiction. The success of the new system in Boston led to its adoption in New York City in 1918 and in Essex County (Newark), N. J., in 1927. In each of these urban centers the superiority of the medical examiner system has been amply demonstrated.

In sparsely settled rural counties the problem of the antiquated coroner's office is more difficult to solve because of the relatively small amount of work to be done. In Massachusetts outside of Suffolk County the medical examiner system is an improvement over the coroner system but still leaves much to be desired. With modern transportation facilities there is no necessity for from one to eleven medical examiners per county. In rural regions the consolidation of two or more adjoining counties into a medical examiner district under a single examiner might induce competent young physicians to enter the field of medicolegal pathology.

March 29, a bill abolishing the coroner's office and setting up an examiner system was introduced into the legislature of Michigan. The essential features of the title of this bill are:

> A bill relative to investigations in certain instances of the causes of death within this state due to violence, negligence or other act or omission of a criminal nature; to provide for the taking of statements from injured persons under certain circumstances; to abolish the office of coroner, and to transfer the powers and duties to a state medical examiner and to county medical examiners; to create the office of state medical examiner, and provide for county medical examiners and assistants, and to prescribe their powers and duties . . .

The state medical examiner, who has no counterpart in the coroner system of any state, in addition to qualifications as to residence, profession and licensure shall "possess special training in pathology and the investigation of violent deaths." He "is authorized to incur such . . . expenses and employ such assistants as shall be necessary in carrying out the provisions of this act." A reasonable appropriation for this provision would assure the organization and maintenance of a central medicolegal laboratory or institute, which would serve the entire state through the county medical examiners. This would be the most enlightened step in this field thus far taken in this country and would go far in the development of a system of scientific medicolegal investigation. It is further provided that the state medical examiner shall supervise the county examiners, shall consult and advise with them, and may perform the duties of any county examiner who may be negligent in the performance of his work.

For each county there is to be a county medical examiner appointed for a term of three years by the board of supervisors with the approval of the state medical examiner. The county examiner must be a resident of the county for which he is appointed, or of an adjoining county. The latter provision makes it possible for a single examiner to serve two adjoining counties. This is a step toward desirable functional consolidation. The board of supervisors may also appoint, with the approval of the state medical examiner, such deputy county medical examiners as may be necessary. This would insure the proper performance of the work of populous counties. The state medical examiner may recommend to the county board of supervisors the removal of any county examiner or deputy who may fail to perform his duties properly.

County medical examiners are authorized to make the necessary examinations of the bodies of such persons "as are supposed to have come to their death by violence; without medical attendance up to a time thirty-six hours prior to the hour of death; abortion, whether self induced or otherwise; or in case any prisoner in any county or city jail shall die while so imprisoned." The county examiner is the sole judge of the necessity for postmortem examination in such cases. He may retain, for so long as may be necessary, such parts of the body as may be necessary for the detection of crime. On written order of the prosecuting attorney or attorney general or on petition of six electors of the county, the county medical examiner may investigate the death of any person whose death is believed to have occurred in the county. No dead body may be cremated without the consent of the county medical examiner. The latter official is authorized to take the statement of "any person who has been

V 1
1937

injured by the criminal act, omission or negligence of another, and there is reason to believe that death is impending."

One of the worst features of the coroner system is the coroner's jury, as such juries are usually constituted. The Michigan act does not require a jury but makes the calling of a jury optional with the county medical examiner. The latter may issue summons; failure of attendance is subject to penalty. If it appears that death was due to the unlawful act of another, the county medical examiner shall submit his conclusions and those of the jury, if one was called, to the prosecuting attorney. Any and all medical examiners may be required to testify in behalf of the state.

In a measure so enlightened as this, it is a matter of regret to note one seriously undesirable feature. The bill provides that the state medical examiner is to be appointed by the governor for a term of four years. This carries with it the potentiality of making the medical examiner system a part of a state political machine. The terms of governor and state medical examiner should not coincide. If appointment is made by the governor, the term of the state medical examiner should be seven years, as in Massachusetts. It is to be hoped that this feature will be amended and that the measure will become a law. To Michigan would then belong the credit of being the first state to devise a statewide agency for the scientific investigation of deaths of which government must take official cognizance.

Current Comment

COLLAPSE WHILE SWIMMING

The fact that collapse and sudden death while swimming may be due to hypersensitiveness to cold has now been generally recognized. Horton and Roth[1] of the Mayo Clinic now report a further study of this phenomenon, stating that in Minnesota alone approximately 3,000 persons have drowned while swimming since 1920, and that it seems likely that at least some of them were victims of this abnormal reactivity. Physical agents such as cold, they state, probably cause increased permeability of the tissue cells and permit the release of chemical substances. As a result of cold it seems that a histamine-like substance is released and that this, in addition to producing the usual urticarial changes locally, frequently attains sufficient concentration in the general circulation to produce reactions in every way comparable to those obtained when histamine is injected into the body. Nevertheless present chemical methods are not sufficiently sensitive to allow exact quantitative estimation of the histamine-like substance in the blood and therefore corroboration awaits more exact analytic methods. Individual hypersensitiveness can be easily determined by immersion of the hand in ice water at 8 to 10 C. for five minutes. Prior to immersion, observations on the blood pressure and pulse rate are made and continued at intervals of one minute while the hand is immersed in the water and for a period of twenty minutes after removal from the water. If swelling of the hand occurs after it has been removed, the indication is that the patient is hypersensitive to cold. A systemic reaction is indicated by a drop in blood pressure, an increase in the pulse rate and flushing of the face. The Rochester investigators hold the opinion that all subjects who demonstrate a systemic reaction to this test are likely to develop symptoms of collapse if they swim in cold water. The disorder, however, is readily amenable to treatment. Systemic desensitization can be accomplished either by short immersions of the hand in cold water for one or two minutes twice a day for three or four weeks or by subcutaneous injections of 0.1 mg. or less of histamine twice daily for from two to three weeks.

1. Horton, B. T., and Roth, Grace M.: Collapse While Swimming: The Most Dangerous Consequence of Hypersensitiveness to Cold, Proc. Staff Meet., Mayo Clin. 12:7 (Jan. 6) 1937.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Institute for Tuberculosis Workers.—An institute for tuberculosis workers will be conducted at the University of Southern California, June 14-26, under the direction of Philip P. Jacobs, Ph.D., director of publications and extension, National Tuberculosis Association. The course will be given in cooperation with the state and local tuberculosis associations. Information may be obtained from the National Tuberculosis Association, 50 West Fiftieth Street, New York.

COLORADO

Dr. Jackson Gives Memorial Lecture.—Dr. Edward Jackson, emeritus professor of ophthalmology, University of Colorado School of Medicine, Denver, delivered the third annual Phi Rho Sigma Memorial Lecture on "Light, and the Branching of Medicine," April 21. The lectureship was inaugurated by Psi chapter of Phi Rho Sigma as a memorial to deceased members of the chapter.

DISTRICT OF COLUMBIA

Short Course on Criminal Investigation.—The Institute of Criminal Science, Washington, D. C., is offering a short course in modern scientific methods of criminal investigation, June 14-July 10, at Georgetown University School of Medicine. The program includes a fifty minute lecture on "Medical Fakes and Their Detection."

GEORGIA

State Medical Election.—Dr. Grady N. Coker, Canton, was chosen president-elect of the Medical Association of Georgia at its annual meeting in Macon, May 14, and Dr. George A. Traylor, Augusta, was inducted into the presidency. Other officers elected are Drs. Charles Hall Farmer, Macon, and Hulett H. Askew, Atlanta, vice presidents. Dr. Edgar D. Shanks, Atlanta, has three more years of a five year term to serve as secretary-treasurer. The next annual meeting will be held in Augusta, May 10-13, 1938.

Society News.—The Fulton County Medical Society was addressed April 15 by Dr. George A. Williams on "The Elliott Treatment as Prophylaxis for Gonorrhea in the Female" and Mr. Earle A. Rowell, "Narcotics as Related to White Slavery, Crime, Prostitution and Medical Practice."——A recent meeting of the Georgia Medical Society was addressed in Savannah by Dr. Joseph W. White, Greenville, S. C., on "Progressive Bone Growth Deformities and Reformities."——Among other speakers, Dr. Frank K. Boland, Atlanta, discussed surgical treatment of pulmonary tuberculosis before the Spalding County Medical Society in Griffin recently.

nursing care was given to 13,955, pharmaceutical prescriptions to 68,434 and surgical or optical appliances to 18,466. The total expenditure for medical and nursing care was $1,126,000, of which $783,069 was spent for physicians' services, $63,210 for nurses, $200,073 for prescriptions, and $79,648 for surgical and optical supplies. In 82 per cent of the families there were acute house-confining illnesses that required two or more doctors' visits. The remaining 41,584 families were either referred to hospitals or clinics after the physician's first visit or suffered from chronic illness.

NORTH CAROLINA

Society News.—Drs. Claude B. Squires and Addison G. Brenizer, Charlotte, addressed the Mecklenburg County Medical Society, March 2, on "Mandelic Acid Therapy in Urinary Infections" and "Harelip and Cleft Palate" respectively.——Dr. Paul H. Ringer, Asheville, was the guest speaker at a meeting of the Eighth District Medical Society, April 8; he spoke on "Differential Diagnosis of Pulmonary Disease."

OHIO

Fifty Years of Service.—Dr. Lyman A. Brewer, chief of staff of the Mercy Hospital, Toledo, since it was founded in 1918, was guest of honor at a banquet, May 8, in recognition of his completion of fifty years in the practice of medicine and presented with an automobile, a plaque and a medal. Dr. Louis R. Effler was toastmaster at the dinner. Dr. Brewer graduated from the University of Michigan Medical School in 1887 and began practice in Toledo in 1889. He was formerly dean and professor of surgery at Toledo Medical College and assisted with the organization of Mercy Hospital in 1918. The Toledo Academy of Medicine recently made Dr. Brewer an emeritus member.

One Day Institute on Syphilis.—A one day institute on syphilis was held at the Cincinnati General Hospital, May 13. The program opened with a clinical demonstration and presentation of patients with acute syphilis. The guest speakers included Drs. Clyde L. Cummer, Cleveland, and William A. Hinton, Boston, who addressed a special meeting of the Academy of Medicine of Cincinnati in the evening on "The Rôle of the Private Practitioner in the Early Recognition and Treatment of Acute Syphilis and the Relations to the Local, State and National Health Organizations" and "How the State of Massachusetts Functions in the Control of Syphilis" respectively. Both speakers led a round table discussion in the afternoon and Dr. Cummer addressed a meeting at the University of Cincinnati College of Medicine.

New Professors at Ohio State.—Dr. Emmerich von Haam, assistant professor of pathology, Louisiana State University Medical Center, New Orleans, has been appointed professor and chairman of the department at Ohio State University College of Medicine, Columbus, effective July 1, and Dr. Jesse Fremont Bateman, superintendent of the Columbus State Hospital, has been appointed professor of clinical psychiatry. Dr. Carl L. Spohr has been acting chairman of the department of pathology since the death of Dr. Ernest Scott in 1934. Dr. von Haam graduated in 1926 from the Faculty of Medicine of the University of Vienna. Following a year's graduate work, he was awarded a fellowship of the Rockefeller Foundation, later receiving an appointment at the University of Arkansas as associate professor of pathology. He has been at Louisiana State University for six years. Dr. Bateman, who is 39 years of age, graduated from the University of Cincinnati College of Medicine in 1928.

PENNSYLVANIA

Dr. Gross in New Position at Polyclinic.—Dr. Herbert F. Gross has been elected to the newly created position of medical director of the Harrisburg Polyclinic Hospital. The position was created at a recent meeting of the board of directors of the hospital, at which the charter was amended and new by-laws governing the institution were adopted, it is reported. Dr. Gross is a charter member of the hospital board and staff and has served as chief surgeon since the organization of the latter.

Philadelphia

Personal.—A bronze plaque was unveiled at the Frederick Douglass Memorial Hospital, April 30, in honor of Dr. Lawrence F. Flick for his work on tuberculosis. Dr. Berton C. Truitt, chief of the medical staff, presided, and Dr. John P. Turner, head of the department of surgery, unveiled the tablet. Speakers included Judge Harry S. McDevitt, chairman of the board of directors; William C. Hunsicker, director of public works; Ralph Senter, member of the board of directors, and Dr. Thomas S. Burwell, head of the tuberculosis department.

Anniversary of College of Physicians.—The one hundred and fiftieth anniversary of the College of Physicians of Philadelphia was observed, May 14-15. The first day Mr. Roland S. Morris, president, American Philosophical Society, spoke on "The College and Its Present Opportunities," and Dr. David Riesman, emeritus professor of clinical medicine and professor of the history of medicine, University of Pennsylvania School of Medicine, "The College, Its Library and Other Treasures." After these addresses, the building, with its reading and seminar rooms, stacks, incunabula and special collections, Mutter Museum, and special exhibits illustrating the early days of the college, was inspected. In the evening thirty-two delegates from foreign and American institutions of learning were welcomed by the president, Dr. George P. Müller. Speakers included:

Sir Henry H. Dale, director, National Institute for Medical Research, Hampstead, England, Medicine as an Experimental Science.
Dr. Hans Zinsser, professor of bacteriology and immunology, Harvard University Medical School, Boston, The Transformation of Medicine by Public Health Development.

At the fellows' banquet, Saturday, Dr. Henry E. Sigerist, William H. Welch professor of the history of medicine and director of the Institute of History of Medicine, Johns Hopkins University School of Medicine, Baltimore, discussed "The Beginnings of Scientific Societies"; Dr. Francis R. Packard, "Last Fifty Years of the College," and Dr. Müller, "The Future of the College." The College of Physicians of Philadelphia was established in 1787 and as part of its objective to advance the science of medicine awards annually the Alvarenga prize.

Pittsburgh

Society News.—At a meeting of the Allegheny County Medical Society, Pittsburgh, May 18, the speakers included Dr. Sidney M. McCurdy, Columbus, Ohio, on "The Advantages of a Medical Bureau of Economics."——Dr. Leon Herman, Philadelphia, discussed "Renal Tumors" before the Pittsburgh Medical Society at its annual meeting, May 10.

Mellon Lecture.—Edward A. Doisy, Ph.D., professor of biochemistry and director of the department, St. Louis University School of Medicine, St. Louis, gave the twentieth Mellon Lecture under the auspices of the Society for Biological Research of the University of Pittsburgh School of Medicine at the new building of the Mellon Institute for Industrial Research, May 13. Dr. Doisy's subject was "The Ovarian Follicular Hormone."

UTAH

New Department of Social Welfare.—A department of social welfare has been created at the University of Utah, Salt Lake City, to provide professional training in social case work, it is announced. Present plans call for a two year course, which may be taken by senior students. Arthur L. Beeley, Ph.D., since 1927 professor of sociology and director of the Bureau of Student Counsel at the university, has been placed in charge.

WASHINGTON

The Annual Health Conference.—The Presidents' Forum, an organization of the presidents of various women's clubs in Seattle, held its annual health conference April 26-27 under the sponsorship of the King County Medical Society. Heretofore the conference has been sponsored by the state department of health. Mrs. Walter Raymond Jones, president-elect of the woman's auxiliary of the county medical society, directed the program. Various members of the society spoke on timely subjects, and round table discussions were directed by Drs. Clarence Luverne Smith, representing pediatricians; Raymond L. Zech, the Seattle Health Council, and Donald G. Evans, state health officer.

Society News.—The King County Medical Society was addressed in Seattle, May 17, by Drs. Kenneth K. Sherwood, Kirkwood, and David Metheny, Seattle, on "Chronicity of Rheumatic Fever" and "Instrumental Perforation of the Rectosigmoid" respectively. At a meeting, April 19, Drs. Arnold W. Hackfield and Louis H. Edmunds, both of Seattle, spoke on "Significance and Interpretation of Low Basal Metabolism Without Myxedema" and "Common Injuries to the Soft Structures About the Knees" respectively.——Dr. Karl A. Menninger, Topeka, Kan., addressed the Pierce County Medical Society, Tacoma, recently, on "Neuropsychosis in Hypertension."——Drs. Glenn N. Rotton and Harold Frederick Thorlakson, Seattle, addressed the Skagit County Medical Society, Oak Harbor, recently, on "Management of Breech" and "Sinu-

V 10
1937

sitis" respectively.——Drs. John F. Beatty and Herbert W. E. Johnson addressed the Snohomish County Medical Society, Everett, recently, on "Postoperative Lung Complications" and "Transurethral Resection" respectively.—— Dr. Robert F. E. Stier, Spokane, addressed the Walla Walla Valley Medical Society, Walla Walla, recently, on "Desensitization by Oral Administration of Pollen Extracts."

WEST VIRGINIA

Refresher Courses.—The division of maternal and child hygiene of the state health department and the West Virginia Medical Association have planned a series of refresher courses in obstetrics and pediatrics during July and August. They will be held in the following towns: Charleston, Parkersburg, Huntington, Logan, Williamson, Bluefield, Welch, Beckley, Lewisburg, Elkins, Romney, Wheeling, Clarksburg, Fairmont and Morgantown. Lecturers announced in the *West Virginia Medical Journal* are Drs. James R. McCord, Atlanta; Everett D. Plass, Iowa City, and Lee Palmer, Louisville, Ky.

PHILIPPINE ISLANDS

Study of Leprosy.—A special committee on leprosy was recently formed in Manila to carry out a research project in Welfareville with children of leper parents as subjects. The study will cover research on leprosy immunization and the determination of the presence of the lepra bacillus in persons through the reaction of the bacilli to protein serum and vaccines. It will be supervised by Dr. Earl B. McKinley, dean and professor of bacteriology, George Washington University School of Medicine, Washington, D. C., and members of the newly appointed committee: Drs. Sulpicio A. Chiyuto, Manila; Cristobal Manalang, Manila; Felix Velasco, Manila; Jose N. Rodriguez, Mandaue; Casimiro B. Lara, Culion, and Herbert Windsor Wade, Culion.

CANADA

Vancouver Summer School.—The annual summer school sponsored by the Vancouver Medical Association will be held June 22-25 at the Hotel Vancouver, Vancouver. The speakers will be Drs. Leonard G. Rowntree, Philadelphia; William Boyd, Winnipeg; Paul B. Magnuson, Chicago; Harold Brunn, San Francisco, and Donald V. Trueblood, Seattle. Among the subjects to be discussed are endocrine diseases, chronic arthritis and hypertension by Dr. Rowntree, tumors of the mouth, neck and uterus by Dr. Trueblood, fractures of the femur, the forearm and the elbow by Dr. Magnuson, lung abscess, empyema, cancer of the colon and hemorrhage by Dr. Brunn, and bronchogenic carcinoma, nephritis and tumors by Dr. Boyd. Drs. Boyd, Trueblood and Bede J. M. Harrison will present a symposium on carcinoma of the breast.

Society News.—Dr. Milton H. Erickson, Eloise, Mich., addressed the Ontario Neuropsychiatric Association recently at London on "The Applications of Hypnosis to Psychiatry."—— The program of the Academy of Medicine of Toronto, April 6, was arranged by the Hamilton Academy of Medicine with the following speakers: Drs. William J. L. Deadman, "Wilms' Tumors"; Otto W. Niemeier, "Some Indications for Gallbladder Surgery and the Importance of Earlier Operation," and William R. Jaffrey, "Dermatologic Neurosis." Dr. Thomas Anwyl Davies, director of the venereal disease department and lecturer at St. Thomas's Hospital, London, England, discussed "The Control of Venereal Disease in Great Britain—Statistical, Administrative and Therapeutic," before the academy, May 3.

Public Health Meeting.—The Canadian Public Health Association and the Ontario Health Officers Association will hold their annual sessions in Ottawa, June 17-19, at the Chateau Laurier. The tentative program announces the following speakers:

Dr. Clarence E. Hill, Toronto, president, Ontario Health Officers Association, Certain Problems of Health Administration Common to All Health Officers.
Dr. Frederick W. Jackson, Winnipeg, Manitoba, Poliomyelitis.
E. W. McHenry, Ph.D., Toronto, Causes of Malnutrition.
Dr. Ronald Hare, London, Puerperal Fever.
N. L. Burnette, Ottawa, Accident Control.
Dr. Albert Grant Fleming, Montreal, Mental Hygiene.
Dr. Douglas V. Currey, St. Catharines, Ont., Health Administration.
Dr. Robert E. Wodehouse, Ottawa, Ont., The Federal Department of Health.
Dr. Malcolm R. Bow, Edmonton, Alta, president, Canadian Public Health Association (subject not announced).

At the annual dinner Friday evening, the speakers will be C. G. Power, minister of pensions and national health and honorary president of the Canadian Public Health Association, and Dr. Frank G. Boudreau, formerly of Geneva, Switzerland, director of the Milbank Fund.

GENERAL

Reunion of A. E. F. Physicians Proposed.—It has been proposed that physicians who served overseas during the World War with Evacuation Hospital No. 14 have a reunion during the annual convention of the American Legion in New York in the fall. Those who are interested are requested to communicate with Charles Meloy, Room 3050, Grand Central Terminal, New York, or Ernest O. Bianco, Elmsford, N. Y.

Executive Secretary for Academy of Pediatrics.—Dr. Thomas B. Cooley, professor of pediatrics, Wayne University School of Medicine, Detroit, has been appointed executive secretary to the council for pediatric research of the American Academy of Pediatrics. The council, which was established in 1935, includes Drs. Cooley, Kenneth D. Blackfan, chairman, and Fritz B. Talbot, of Boston; Dr. Alexis F. Hartmann, St. Louis; Dr. Irvine McQuarrie, Minneapolis, and Dr. Oscar M. Schloss, New York. Dr. Cooley is 65 years of age and a graduate of the University of Michigan School of Medicine, class of 1895. He was formerly president of the American Academy of Pediatrics.

Misrepresentation of Burial Vaults.—The Federal Trade Commission recently ordered the Cast Stone Company, Columbus, Ohio, to stop advertising that its burial vaults will harden with age and finally become adamant or of impenetrable hardness. The company agreed to stop asserting that its vaults will endure for centuries or for all time, free from the inroads of water or rodents. It will also cease implying that the material of which its vaults are made is the only material which, regardless of burial conditions, is strong and dependable enough to exclude water indefinitely, when such is not a fact. The commission's stipulation points out that vaults made of concrete are in many cases subject to the effect of and are appreciably affected by corrosion caused by the presence in the soil of alkali and other soluble chemicals.

American Association for the Study of Goiter.—The annual meeting of the American Association for the Study of Goiter will be held in Detroit, June 14-16, at the Book-Cadillac. The tentative program lists the following speakers:

Dr. Joseph L. DeCourcy, Cincinnati, Iodine Metabolism—Normal and Abnormal; Its Relation to the Reticulo-Endothelial System.
Dr. Saul Hertz, Boston, Prognostic Criteria in Selection of Cases of Exophthalmic Goiter for Nonsurgical Treatment.
Dr. George W. Crile, Cleveland, Comparative Anatomy and Physiology of the Thyroid Gland.
Drs. Walter M. Boothby and William A. Plummer, Rochester, Minn., Interpretation of Basal Metabolic Rates in the Relatively Normal Individual.
Drs. Howard M. Clute and Fuller Albright, Boston, Management of Minor Complaints After Thyroidectomy.
Dr. Charles W. Mayo, Rochester, Minn., Malignancy of the Thyroid: Further Observations.

"Radio Pratique" Supplants Quarantine.—Beginning February 1, the U. S. Public Health Service placed into effect the system of clearing certain passenger vessels by "radio pratique" instead of by the customary quarantine inspection. According to *Public Health Reports*, seventy-six vessels entering New York used the system 127 times in forty-six days during the period February 1-March 26. The 127 entries totaled 1,513,104 net tons and carried 42,438 passengers and 48,973 crew members. While the report covers a period of fifty-four days, there were eight days on which no eligible vessels entered the port. The seventy-six vessels, of 822,308 net tons, belonged to eighteen steamship companies under nine flags: British, American, German, French, Italian, Swedish, Dutch, Polish and Norwegian. "Radio pratique" was inaugurated to facilitate the landing of steamship passengers in the port of New York and is considered the most radical alteration of the country's sanitary defenses against the importation of foreign disease and pestilence since the first quarantine station was established in New York Harbor in 1758 (THE JOURNAL, February 6, page 484).

Certification Without Examination by Board of Internal Medicine.—Until July 1, the American Board of Internal Medicine will receive applications for certification without examination from the following groups:

Professors and associate professors of medicine of approved schools of medicine of the United States and Canada.

Physicians who have practiced the specialty of internal medicine for ten years and are fellows in good standing in one or more of the following special societies of internal medicine: (1) American College of Physicians, (2) Royal College of Physicians of Canada, (3) Association of American Physicians, (4) American Clinical and Climatological Association, (5) American Gastro-Enterological Association, (6) American Society for Clinical Investigation, (7) Central Society for Clinical Research.

Physicians, members of the American Medical Association, who have practiced the specialty of internal medicine for fifteen years, and are recommended by the Executive Committee of the Section on the Practice of Medicine of the American Medical Association.

Requests for application forms should be received before July 1, at the Office of the Chairman, Dr. Walter L. Bierring, 1210, 406 Sixth Avenue, Des Moines, Iowa.

Cancer Foundation in Honor of Drs. Howell and Finney.—A foundation for the study of cancer will be created under the will of the late Dr. George Walker, head of the outpatient department of the Johns Hopkins Hospital, Baltimore, who died from cancer March 31. It will be known as the Finney-Howell Research Foundation, in honor of Dr. John M. T. Finney, emeritus professor of surgery at Johns Hopkins University Medical School, and Dr. William H. Howell, emeritus professor of physiology at the School of Hygiene and Public Health. The primary object of the foundation is to provide a series of fellowships for the study of cancer, each with an annual stipend of $2,000, although special grants may be made to support the work done by the fellows. With no laboratory or institute of its own, the foundation will expend all the money in supporting the work of the fellows. The will places $300,000 at the disposal of the foundation, to be expended within ten years. The fellowships will be annual appointments but may be renewed for a period of three years and may be awarded to workers in institutions in any part of the world. Members of the board of scientific directors include Drs. Finney and Howell; Philip Bard, Ph.D., Drs. Curtis F. Burnam, William A. Fisher, Wade Hampton Frost and Warren H. Lewis of Baltimore; Evarts G. Graham, St. Louis; Ernest L. Kennaway, London; Jonathan C. Mealkins, Montreal, and Florence R. Sabin, New York. The financial directors of the foundation are Jesse N. Bowen, Frederick G. Boyce Jr. and Lee E. Daly, all of Baltimore.

Various Sentences for the Eyesight Swindlers.—The arrest of persons involved in the eyeswindling racket was reported in THE JOURNAL, Dec. 19, 1936, page 2059. The arrests were brought about by the U. S. Post Office Department. According to a recent report, Edward Robinson, alias Eddie A. Robinson, pleaded guilty in Shelby, N. C., March 15, to an indictment charging him with using the mails to defraud. He was sentenced to two years in jail on each of two counts, but the second was suspended for five years pending his good behavior. In Alexandria, Va., in the U. S. district court, Roy L. Martin, Curtis Yeager and Jack Holtkamp pleaded guilty to similar charges. Martin was sentenced to nine years and six months; Yeager's sentence of six years will begin on the completion of a sentence of five years which he is now serving in the Virginia State Penitentiary at Richmond, and Holtkamp's sentence of five years will commence at the expiration of a sentence of one year and one day, which he is now serving in the U. S. Penitentiary at Leavenworth, Kan. Frank Mackett Jr., an attorney in Milwaukee who deposited checks sent him by the swindlers for collection, remitting the proceeds less 10 per cent commission, was sentenced to seven years and to pay a fine of $25,000. William E. Hanecy received a concurrent sentence of three years on one count and two years on another count, Lewis Levy was fined $500 and Jerry Theeman was sentenced to four years. Other arrests, not included in the earlier list in THE JOURNAL, include James Henry Howard, alias Jimmy Head; William and Susie Sachs, who have been indicted in the western district of North Carolina; Raymond B. Hall, arrested at Nashville, Tenn., and removed to Norfolk, Va., for trial, and Ernest Mandell, arrested March 6 to stand trial in Milwaukee.

FOREIGN

Medal for X-Ray Research.—A David Anderson-Berry gold medal and a money prize amounting to about £100 will be awarded in July 1938 by the Royal Society of Edinburgh to the person who in the opinion of the council has produced the best recent work on the nature of x-rays in their therapeutic effect on diseases in human beings. Applications for this prize are invited. Both published and unpublished work may be submitted. Applications must be in the hands of the general secretary of the Royal Society of Edinburgh, 22 George Street, Edinburgh 2, by June 1, 1938.

Congress on Child Psychiatry.—The first International Congress on Child Psychiatry will be held in Paris July 24 to August 1, at the Maison de la chimie, 28 rue Saint-Dominique. Subjects to be discussed are neurophysiologic bases for child psychiatry, educational methods, and mental debility as a cause of infantile and juvenile delinquency. Among American physicians to take part in the discussions are Drs. Arnold L. Gesell, New Haven, Conn.; Lauretta Bender, New York, Frederick L. Patry, Albany, and Frederick Peterson, New York; Arthur H. Ruggles, Providence, R. I., and William Healy, Boston. The secretary-general is Dr. Leon Michaux, 74 Boulevard Raspail, Paris.

Foreign Meetings.—An International Congress on the Short Wave in Physics, Biology and Medicine will be held in Vienna, July 12-17. The address of the secretariat is Alserstrasse 4, Vienna IX.——The twenty-first annual conference of the National Association for the Prevention of Tuberculosis of Great Britain will be held in Bristol, July 1-3. Information may be obtained from the Acting Secretary General, Tavistock House North, Tavistock Square, London, W. C. 1.——On the program of the International Congress on Hepatic Insufficiency to be held in Vichy, France, September 16-18, the following physicians of the United States are listed as participants: Drs. Lathan A. Crandall Jr., Chicago; Andrew C. Ivy, Chicago; Norman W. Elton, Reading, Pa., and Hyman I. Goldstein, Camden, N. J. This congress will be preceded by the second International Congress of Gastro-Enterology, in Paris, September 13-15. Those wishing to attend these congresses may receive information from Dr. Anthony Bassler, 121 East Seventy-First Street, New York.——The twenty-sixth annual meeting of the Oxford Ophthalmological Congress will be held at Keble College, Oxford, July 8-10. Among the speakers will be Dr. Bernard Samuels, New York, on "The Histopathology of Papilledema."

Deaths in Other Countries

Joseph Halban, professor of gynecology, University of Vienna, died April 23, aged 76.——**Sir George W. Badgerow,** London, vice president of the British Medical Association, died suddenly, May 9, in London, aged 65.——**Samuel Alexander Kinnier Wilson,** Croonian Lecturer, Royal College of Physicians, London, 1925; Morison Lecturer, Royal College of Physicians, Edinburgh, 1930; president, Section of Psychiatry, Royal Society of Medicine, London, 1930-1931; honorary member, neurological societies of Italy, Poland, Pzris, Vienna, Philadelphia, Society of German Neurologists and Medical Society of Copenhagen and of the American Neurological Association; president, Royal Medical Society, Edinburgh, 1902-1903, died, May 12, following an operation.

Government Services

The Wellcome Prize

The Sir Henry S. Wellcome Medal and Prize of $500 will be awarded this year for the best paper on "The Contributions of the World War to the Advancement of Medicine." Competition is open to medical department officers and former officers, acting assistant and contract surgeons of the army, navy, public health service, organized militia, U. S. Veterans' Administration, U. S. Volunteers and the reserves of the United States, commissioned medical officers of foreign military services, and all members of the association. Further information on the competition, which closes August 15, may be obtained from the secretary of the Association of Military Surgeons of the United States, Army Medical Museum, Washington, D. C.

Scientific Research Division Reorganized

Under the recent reorganization of the Scientific Research Division of the U. S. Public Health Service, effective February 1, three new divisions were established at the National Institute of Health: the division of biologics control under the direction of Sr. Surg. Walter T. Harrison; the division of public health methods, which incorporates the work of the former field office of public health methods with the work of the offices of child hygiene, milk investigations, statistical investigations and the laboratory of stream pollution investigations, under the direction of Surg. Joseph W. Mountin, and the division of industrial hygiene, which coordinates the work of the former office of industrial hygiene and the extensive laboratory studies of occupational dermatoses carried on at the National Institute of Health, under the supervision of Sr. Surg. Royd R. Sayers. The former division of bacteriology and pathology was further reorganized so that part of the division relating to bacteriology is known as the division of infectious diseases. Under the direction of Sr. Surg. Rolla E. Dyer, this division covers the field and laboratory work relating to infectious diseases, including leprosy studies, malaria investigations, the Rocky Mountain Laboratory, tuberculosis and epidemiologic studies. The division of pathology now includes the field office of cancer investigations. The former divisions of chemistry, pharmacology and zoology of the institute remain under the direction of Claude S. Hudson, Ph.D., Carl Voegtlin, Ph.D., and Maurice C. Hall, D.V.M., respectively. According to the *Health Officer*, the National Institute of Health has become, in fact, the Scientific Research Division. Asst. Surg. Gen. Lewis R. Thompson, in charge of scientific research, is now director of the institute.

V 10
1937

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 8, 1937.

Changes in the Forms of Illness

Lord Horder recently said that the expectation of life had risen by fifteen years in the past two generations and that the increase in cancer might be no more than a confirmation of that fact. Influenza was still the great plague. The decrease in tuberculosis during the past thirty years was perhaps the greatest achievement in the control of infectious diseases in this generation. Fifty years ago the large industrial cities were full of rickets. Today the disease was fast dying out. Gout had greatly declined in its most classic phases, such as acute inflammation of the big toe, but the same processes may be expressed in the circulatory apparatus. There was a considerable increase in the prevalence of diabetes. Neurasthenia was now one of the major problems of medicine, as regards both its causes and its treatment.

The Pasteurization of Milk

In the House of Lords the government announced its intention of bringing forward legislation dealing with the milk policy generally. Lord Dawson, president of the Royal College of Physicians, said that the numerous epidemics of recent years caused by infected milk made the problem urgent. He agreed that if pure milk from healthy herds could be obtained and pasteurization made unnecessary it would be ideal, but that the financial and technical difficulties were immense. He saw no other way of dealing with this vital question than a properly controlled and organized system of pasteurizing milk. The mortality from tuberculosis had declined, but there had not been the improvement in the bovine type of infection encountered with regard to the human type. What was the good, Lord Dawson asked, of spending large sums on health services while leaving this bad sore open?

Mental Disorder Following Head Injury

Before the section of psychiatry of the Royal Society of Medicine, Dr. C. P. Symonds communicated a minute study which he had made of mental disorder following head injury, based on sixteen cases in which the acute symptoms lasted from three weeks to fourteen months. These were all "closed cases." He excluded cases of compound fracture, in which the clinical picture might be complicated by laceration of the cortex or by infection. Even closed injuries might be accompanied by clinical evidence of coarse focal lesions; for instance, hemiplegia or dysphasia. These too he excluded, his object being to present what appears to be the direct effect of injury on the cerebral function as a whole.

The principal mental disorder after head injury was loss of consciousness in some degree. The qualification was necessary because confusion was apt to arise in practice as to what loss of consciousness meant. It might be argued that a man who could answer questions, such as giving his name and address, after an accident, was conscious. But if next day he had no recollection of having done so, or of the time when the accident occurred, he might be said with equal reason not to have been fully conscious. The duration of unconsciousness might be measured by that of the traumatic amnesia.

Take the common case of minor injury—so-called concussion. At the moment of the accident the clinical picture was dominated by the physical state of complete flaccid paralysis. The mental state was profound stupor, from which recovery was always gradual, through a stage of dazed bewilderment and, after this, automatism, before full consciousness returned. The initial deep stupor might be momentary, while the process of recovery was spread over a longer period. This was particularly true for the phase of automatism, as in the injured football player who played to the end of the game, with subsequent amnesia. Occasionally the loss of consciousness after injury might be delayed.

After severe injuries, recovery to full consciousness might be spread over days, weeks or even months. Between these two extremes every gradation might be observed. In one case the mental disorder might be dismissed as "after-effects of concussion"; another might be dignified by the title of "acute traumatic psychosis," but Dr. Symonds believed that there was no essential difference. He considered traumatic psychosis as one disease, recognizing the predominance at one time or other of certain features—in the early stages, stupor; later, confusion; after confusion had faded into the background, amnesia for recent events, with a tendency toward confabulation.

The state of deep stupor rarely lasted more than a day or two, but it might extend to many weeks. As the patient emerged from the stupor he usually was excited, sometimes was dazed, and reacted irritably to interference. He was wet and dirty and had to be fed. Often there was delirium. This state might continue for days, weeks or even months, and there might be an occasional relapse into stupor for two or three days. Gradually conversation became possible and then were found a profound disorientation in space and time and inability to synthesize perceptional data. Memory and judgment were grossly impaired. Thought was impeded by perseveration. Disturbance of speech was conspicuous. The mood was elated and the talk resembled that of hypomania. There was a far reaching retrograde amnesia.

THE PRECIPITATION OF SPECIAL MENTAL DISORDER

Head injury might precipitate specific mental disorder—schizophrenia, paranoia or manic-depressive psychosis. This was shown in two ways. One of the symptoms of post-traumatic dementia was an exaggeration of preexisting traits. Secondly, the injury created an invalidism to which the patient reacted in terms of his mental make-up. Manic-depressive symptoms might appear before the patient recovered from the acute traumatic psychosis.

TRAUMATIC NEURASTHENIA

Why was traumatic neurasthenia more common after head injuries than after injuries of other parts? The answer was that the patients fell into three groups: 1. The accident led to the development of psychogenic states no more frequently after head than after other injuries. 2. There is a group of patients suffering from post-traumatic dementia who are apt to react with anxiety and irritability to tasks beyond their capacity. 3. A group of patients had constitutions before the accident of the depressive or anxious type. The injury precipitates an illness which, once begun, runs its own course—usually toward recovery. These patients are suffering from neurasthenia, which is traumatic in a physical rather than in a psychogenic sense.

The Overtreatment of Gonorrhea

In communications to the *Lancet*, three genito-urinary surgeons, who have had considerable experience in venereal disease clinics, maintain that gonorrhea is much overtreated. Mr. M. F. Nicholls states that acute urethritis subsides as rapidly as acute nasal catarrh with rest in bed. Custom, however, makes gonorrhea an ambulatory disease. When rest cannot be given it is illogical, he believes, to irritate the inflamed mucosa by active measures. Antiseptics cannot destroy gonococci in the urethra without damaging the mucous membrane. Yet posterior irrigation is frequently employed from the onset which unless done efficiently is dangerous. Mr. Nicholls has found it frequently responsible for spreading the infection to the posterior urethra and causing epididymo-orchitis. During the acute stage of posterior urethritis, bladder irrigation fortunately is too painful to be possible. In the chronic stages, when the posterior

urethra is already infected, filling and emptying the bladder from without with an antiseptic is better tolerated, but Mr. Nicholls thinks that it is less efficient and less safe than the passage of large quantities of urine.

Much misdirected energy, he says, is devoted to massaging the anterior urethra and prostate. This treatment seems to be carried out too early, too often and sometimes too violently. But when active inflammation has subsided and collections of mucus are present, occasional massage is probably beneficial. Employed too frequently, it produces a traumatic irritation.

The Effects on Health of the Combustion of Illuminating Gas

The Royal College of Physicians appointed a committee including Dr. W. W. Jameson, professor of public health, London University, and Sir Joseph Barcroft, F.R.S., physiologist, to investigate the effects of the combustion of gas in dwellings and particularly in flueless rooms. The report, which has just been published, shows that with properly working apparatus there is no danger to health whatever. Even in a room with a minimum air change and under conditions of gross vitiation and overheating, such as would result from a continuous gas rate of 1 cubic foot per hour for 50 cubic feet of room capacity, the maximum carbon dioxide concentration will be only about 1 per cent. A sedentary person may breathe air containing 0.02 per cent of carbon monoxide for six hours and develop only mild symptoms, such as slight headache, and there are no lasting deleterious effects. In industrial work, prolonged exposure to 0.01 per cent is permissible and does not produce harm. The committee concluded that 0.005 per cent in living rooms would be innocuous and 0.01 per cent safe. In appliances of good design, combustion is practically complete. With a maximum concentration of 1 per cent of carbon dioxide in a room the carbon monoxide would be only 0.002 and with unsatisfactory apparatus 0.01. But the normal concentration of carbon dioxide is much less than 1 per cent and the carbon monoxide correspondingly less, rarely exceeding 0.0005 per cent. There is no evidence that even the higher concentrations mentioned are injurious to health. The evidence is unconvincing as to the occurrence of any definite group of symptoms that would indicate a chronic form of carbon monoxide poisoning. This view is supported by the fact that this gas is not stored in the tissues and is therefore not a cumulative poison.

PARIS

(From Our Regular Correspondent)

May 8, 1937.

Application of Forty Hour Week to Private Hospitals

A law was passed in June 1936 according to which a salaried employee is obliged to work only forty hours a week. The application of this law to commercial organizations has taken place at a far more rapid rate than was generally thought, resulting in innumerable protests on the part of employers. March 22 a decree, as it is termed here, was issued by the president of the republic, in accordance with a motion of the minister of labor and approved by the cabinet, extending the new law to all public and private institutions engaged in the care of the sick or mentally incapacitated. The French Private Hospital Association is sending to the government the following resolution of protest against the application of the forty hour week to private institutions:

Such an application will create serious difficulties in the necessary surveillance of patients in private hospitals, and sanatoriums and will greatly increase their already existing heavy expenditures for nursing and other personnel. The present high cost of foodstuffs has already necessitated large additional expenditures, because the majority of the personnel receive their meals at these institutions.

Even before this application of the forty hour a week law, the outlay for salaries and maintenance of the personnel had already constituted 35 per cent of the total expenditures. Private patients refuse to accept an increase of more than 20 per cent in the charges for hospital care.

The allowance for care of injured veterans has not been changed since 1922, in spite of two devaluations of the French franc; the allowance for care of those injured in industrial pursuits remains the same as in 1928; finally, the allowances granted to hospitals and other institutions which receive patients covered by social insurance have not been changed in spite of the increase in premiums which all the socially insured must now pay but whose indemnities for sickness or injury are now higher than before. The closing of private hospitals and sanatoriums would throw a great many people out of work; furthermore, such institutions, in case of war, must be considered a part of the national defense. These institutions have decided therefore, in a spirit of loyalty, to attempt to apply the forty hour a week law. However, taking into consideration that employment in a hospital cannot be compared to work in a factory or office, the hospital association feels that, since hospital service is continuous, i. e., a twenty-four hour one, the hospitals have the right, in view of article 38 of the labor code, to insist on daily cessation of work of their employees, in rotation.

In consequence of a recent statement of the minister of labor, in the case of institutions in which service is continuous the working week is regarded as composed of six days, so that each employee is entitled to one day's rest every week.

Tomography in the Diagnosis of Pulmonary Lesions

The new radiographic technic of tomography will be of great aid to those interested in the diagnosis of pulmonary disorders, according to Dr. Etienne Bernard of Paris, who presented a paper at the April 7 meeting of the Académie de chirurgie. It is particularly in pulmonary tuberculosis that tomography will yield important information. For example, to detect a cavity overlooked by the usual methods of diagnosis, to be able to measure its size accurately, to locate it and to evaluate the results of an operation will be possible when this new technic is employed.

Tomography, from the Greek word "section," is needed for the following reasons: Ordinary radiography enables one to interpret the sum of all the images situated in the cone of irradiation of the luminous source. In the case of the thorax, the diameters of which are relatively large, the superposed planes form a sum of images whose analysis is often difficult and the interpretation subject to error. In addition, the shadows of the ribs obscure the normal pulmonary opacity. As a result, in certain regions the lesions can be partially or completely masked. This is particularly true wherever the ribs cross one another or the clavicle and also in the anterior and posterior costomediastinal zones. In addition, a deep seated lesion is invisible when an opacity of greater density lies in front of or behind such a lesion. Finally, a lesion is to be detected only by a difference in the degree of transparency; under ordinary conditions and in certain cases, such a difference can be insufficient, especially if the lesion is small and of slight density. The new technic renders it possible to obtain chest films in the frontal or transverse planes, free from the ordinarily superposed bone shadows. Those who have employed tomography consider it superior to stereoscopy or profile radiography. The principles of tomography are the following: As the result of the studies of Bocage (1922), Vallebona (1930), de Ziedes des Plantes (1932) and the practical adaptations of Grossmann and Chaoul (1935), the present equipment can be briefly described as consisting of an x-ray tube which, instead of being fixed, has a curvilinear movement which is coordinated with a synchronous change in position, but in the opposite direction, of the film holder. The remainder of the

V 10
1937

technic and the interpretation of the tomographs can be read in the original of Bernard's paper (*Mémoires de l'Académie de chirurgie*, No. 11 of volume 63, meeting of April 7, 1937).

The method has been employed extensively during the past few years in Germany by Chaoul and Grossmann and by Reisner and Schmidt, in Italy by Vallebona and in England by McDougall of Maidstone. Bernard showed a number of slides illustrating the technic and its application to the diagnosis of pulmonary lesions. The technic still needs to be improved. The supine position is required at present, which is a disadvantage in radiography of the chest.

International Congress of Industrial Medicine

The International Congress of Industrial Medicine will be held at Paris during the week beginning June 1. Prof. Victor Balthazard, head of the Medicolegal Institute here, will preside. The program includes visits to factories, excursions, entertainments at the exposition and a banquet. Among the papers, those of special interest are on the subjects of instruction in industrial medicine, treatment of workers with cardiac disease or pulmonary tuberculosis, benzene poisoning, and the modern conception of industrial medicine. Those who wish to take part in the congress are asked to write to Dr. G. Hausser, Medicolegal Institute, Paris.

VIENNA

(From Our Regular Correspondent)

April 21, 1937.

Danger of Air Embolism in Thyroidectomy

The Vienna Physicians' Society recently had as a visiting lecturer Dr. Donald Guthrie of Sayre, Pa. He described the mechanism of the air embolisms that may occur in the course of a surgical intervention, especially if the thyroid is involved. Arterial embolism is more dangerous than a venous embolism, since it may lead to embolism in the brain or in the coronary arteries. In the first rank of blood vessels, predisposed to venous embolism, are those veins which are strongly intergrown with the deep cervical fascias. Fatal air embolism in man was first described in 1818, although in medieval times animals were put to death by intravenous insufflation of air. Fatalities from air embolism depend on mechanical and biologic factors; the blood becomes frothy and is forced back into the veins by the systole, a small amount of blood reaching the lungs and the left ventricle. The anemia that ensues in the region of the fourth ventricle (a vital center) causes cessation of respiration. Death occurs only if the amount of entering air exceeds a certain magnitude; the patient may be saved by timely artificial respiration. Small quanities of air cause dyspnea and a fall in blood pressure. Exophthalmic goiter patients are in greater peril if an air embolus appears than patients with other forms of thyroid disease. Diagnosis is easily established by the typical sounds that accompany entrance of air into the vascular system: a hissing sound and a "mill-wheel sound"; the latter is audible at a distance of 1 or 2 meters. Gas bubbles are often observed on the retinal blood vessels. The speaker has observed four embolic accidents, one fatal, which occurred during thyroidectomies. The best treatment is a speedy prophylactic ligature of the exposed vein; one should take care not to apply too great a number of Kocher's forceps. In operation for recurrent goiter the cicatrices are a great source of annoyance. In case of collapse the immediate indication is artificial respiration by means of oxygen and carbon dioxide, since the impairment of respiration precedes the cardiac dysfunction. Intracordial injection of a 2 per thousand solution of epinephrine can also be tried.

In the general discussion of Dr. Guthrie's paper, Professor Denk said that among 378 thyroidectomies observed by him during the past four years there had been three cases of embolism, two mild and one fatal. Professor Ranzi reported similar experiences. He said that in most instances air embolism runs a favorable course. Should an embolic accident occur the patient should immediately be shifted and the field of operation covered with cloths or gauze and common salt solution. Professor Finsterer usually performs a thyroidectomy with the patient in Trendelenburg's position. He considers this the best prophylactic measure that can be taken against embolism. The drawing off of the intruding air by means of a glass tube or of a ureteral catheter advanced from the cubital vein toward the heart is recommended by many. Professor Werkgartner has gone over the necropsies for all the years since 1919 at the Institute of Legal Medicine. Since that year fifty cases of fatal embolism have been reported. Included in this number are embolic accidents connected with induced abortions and puncture wounds. In fatal cases Professor Werkgartner observed from 70 to 120 cc. of air in the right side of the heart. At necropsy it is often most difficult to determine the exact point at which the air entered. It is usually apparent that the frothy blood has been forced by the systole into the pulmonary artery and the larger veins and that relaxation of the heart has caused it to recede, so that blood no longer reaches the periphery of the lungs.

The Electrical Energies of the Organism

At the last session of the Vienna Society of Biology, Professor Dr. Keller of Prague read a highly instructive report of the micro-electrical studies of the liver and connective tissue, to which he has for many years given his attention. Keller has elicited a body of facts which constitute a notable contribution to an understanding of hepatic and connective tissue functions in their relation to metabolism. The basic fact repeatedly stressed by the investigator is this: The interrelation of the cells and the blood is governed by an electrostatic difference in potential; namely, there exists an electrical field in which the blood (serum) acts as a negative pole, and the cells of the liver or of the tissues as a positive pole. Since all nutritive substances possess a certain electrical charge, namely, are capable of being attracted or repelled by the poles according to the law of electrical attraction and repulsion, there must be a certain amount of differentiation among the nutritive substances. On the basis of this selection some substances will infiltrate the cells and others will remain in the blood. If, as is now the case, one is able to prove the validity of these theoretical assumptions by actual observations of metabolic function, it signifies a remarkable correspondence between theory and practice. The Vienna school has already evinced particular interest in this problem, as shown by practical discussions based on the work of Kaunitz, Siedek and Schober at the Eppinger clinic. Professor Keller now demonstrates these facts, using for the first time as an example the healthy liver, and shows what changes appear if the liver is diseased and the electrical tension thus diminished. Infiltration of the liver cells by water and common salt takes place and this renders the organ incapable of performing its normal tasks.

Prof. Dr. Salomon Klein and Prof. Jakob Erdheim Are Dead

The Nestor of the Vienna Faculty of Medicine, Prof. Dr. Salomon Klein-Bäringer, recently died at the age of 92 at Budapest, in which city he had resided for a short time previously. Professor Klein was a pupil of the ophthalmologist Jäger, a teacher of the classic period of the Viennese medical school. Klein's investigations of the interrelation of nerves and blood vessels of the eye, of the condition of the retina in tabes, of dementia paralytica and neuritis optica, and of cataract were of fundamental importance for the development of ophthalmology. He was a brilliant operator and teacher. He attracted to his classes a great number of foreign physicians, to whom he lectured in five different languages. Since he had been

inactive at the policlinic for the last twenty years, the younger generation of ophthalmologists knew of him only through his past contributions.

Vienna University has suffered a great loss in the sudden death of Prof. Jakob Erdheim, who succumbed to an attack of angina pectoris at the age of 63. A pupil and assistant of Professor Dr. Weichselbaum, Erdheim was rated as one of the world's foremost pathologic anatomists. His investigations of the hypophysis and of the parathyroids have come to be of the greatest significance for present-day hormonology. Erdheim was regarded as an authority in the field of histopathology of the skeleton. In the last months of his life he dedicated himself to anatomic studies of the blood vessels. A preeminent teacher who possessed the gift of smooth and precise diction, he was an asset of the first rank to Vienna University. His lectures were perhaps the most visited in all Vienna. His pupils occupy professorial chairs the world over, in America and Asia as well as in Europe. As an international authority, he was the recipient of many high honors despite his personal modesty.

BERLIN

(From Our Regular Correspondent)

May 5, 1937.

The Treatment of Vascular Lesions

Dr. Karitzky, assistant to Professor Rehn, ordinarius in surgery at Freiburg, outlined before the Freiburg Medical Society the principles advanced by Rehn on the treatment of vascular lesions. Lesions of the medium-sized and smaller arteries wherein a corresponding collateral circulation can be substituted for the normal circulation should be treated by acupression and ligation. Hematoma masses that are capable of producing a necrosis of the limb by pressure on the uninjured arteries under the rigid fascias of the lower leg ought to be removed by simultaneous wide severing of the fascias. In minor lesions of the larger, and for the nutrition more important, blood vessels, the restoration of the necessary circulation is accomplished by lateral or annular vascular sutures. The suturing, if effected within the first twenty-four hours, remains intact despite the suppuration that will appear later in the infected region of a wound. The suture brings about improved perfusion in this region and thus exercises a favorable influence on the healing of the wound. In traumatic lesions of larger arteries, the wound is covered with a free venous transplant. Plastic lesion-grafts are contraindicated only if the region of the wound is infected. In wounds from shooting, especially those inflicted by shell fragments, the suppuration of a wound leads to destruction or thrombosis of the transplant. In extensive gunshot wounds there usually is present, however, so severe a degree of destruction that even vascular plastic surgery cannot save the extremity. If, to repair a major lesion by primary suture, it is necessary to subject the lumen of the vessel to considerable traction, a later necrosis of the extremity frequently ensues despite the intact suture and permeability of the arterial lumen. Clinical observations demonstrate that for proper treatment of vascular lesions a knowledge of the physiology of the vascular system is requisite. If the technic is skilful, the results will be gratifying.

It was further observed that there is an adjustment of the venous transplant to the altered velocity within an artery. If the walls of a venous transplant are too weak, the saphenous vein dilates, elongates and serpentines itself even if it is implanted in the length corresponding to the arterial defect. This can be demonstrated by x-ray visualization. The phenomenon is explicable to be sure in terms of arterial pressure. Gradually, however, the venous wall adapts itself functionally to the arterial pressure, as histologic follow-up examinations have shown. The wall thickens (but only through the connective tissue) and becomes stronger, until finally it is commensurate with the pressure and equilibrium is then restored.

The Fight Against Cancer

Early recognition is the main problem of the anticancer campaign. Recently efforts have been made to institute annual examination of the largest possible number of women over 30 years of age for the purpose of detecting any cancerous alterations of the genitalia or of the breasts. Professor Esch, director of the women's clinic of Münster University, has just made public in the *Münchener medizinische Wochenschrift* data bearing on the anticancer campaign in Westphalia. In the year 1931 the number of cancer patients (1,024) admitted to the larger hospitals of the province was 21 per cent greater than the corresponding number (881) in 1930. In 1931 there were 386 admissions of uterine cancer cases against 296 in 1930, an increase of 32.6 per cent. The corresponding figures for breast cancer were 111 admissions in 1931 against 103 in 1930, an increase of 7.7 per cent. These increases were due to the fact that a larger number of cases in which operation could not be performed came to hospitalization. The number of admissions in 1932 was 9.1 per cent greater than that of 1931. The distribution of newly admitted cases during the three years 1930 to 1932 according to operability is given in the accompanying table. The increase in the number of operable cases in 1932 may thus be considered a noteworthy advance. In more than 10 per cent of the inoperable cases of uterine cancer, complete cure was accomplished by radiotherapy; and even in the incurable cases, important partial successes were achieved.

Esch attributes this favorable trend to better education of the public with respect to cancer. The number of persons who consulted a physician immediately after or within a month after the observation of suggestive symptoms increased by 13.4 per cent; namely, from 19.8 to 33.2 per cent of the total number of patients. This increase followed the inauguration of a public propaganda campaign against cancer. Nevertheless, two thirds of the patients had been slow to consult a physician. On the basis of the foregoing data, early medical diagnosis is still lacking in a majority of cases. It was noted in particular that vaginal examination, always a necessary procedure, was frequently omitted, hemorrhages were erroneously interpreted, and the possibility of carcinoma was not given sufficient consideration in cases of younger women presenting metrorrhagia, especially if the patients appeared to be in a good state of nutrition. The illness of many women (11.6 per cent of all the patients) was often first correctly diagnosed at a late date in the clinic because of personal or domestic conditions. Some women needlessly delayed the beginning of proper attention by symptomatic treatments, which usually took the form of cauterization.

Operability of Cancer in Newly Admitted Cases

Year	Uterine Cancer Cases: Percentage Operable	Uterine Cancer Cases: Absolute Number of Cases	Breast Cancer Cases: Percentage Operable	Breast Cancer Cases: Absolute Number of Cases
1930	21.9	274	58.33	96
1931	16.58	386	56.57	111
1932	35.5	355	74.9	338

Marriages

WILLIAM DAVID MACKAY, Mount Vernon, N. Y., to Mrs. Margaret Estee Somers of Bronxville, in Miami, Fla., February 26.

MAURICE L. TOWNSEND to Miss Nell Hamlin, both of Washington, D. C., in Raleigh, N. C., February 18.

STANTON CLIFFORD LOVRE, Watertown, S. D., to Miss Frances Anderson of Lincoln, Neb., March 25.

WILLIAM BENDER MILLER to Miss Helen Jane Stambaugh, both of Harrisburg, Pa., April 17.

MERLIN TREADWELL RYMAN, Chatham, N. J., to Miss Ruth Sparks of Brooklyn, May 8.

V 10
1937

Deaths

Way Sung New ● Shanghai, China; Harvard University Medical School, Boston, 1914; member of the Massachusetts Medical Society; fellow of the American College of Surgeons; secretary of the Council of Medical Missions, and past president of the Chinese Medical Association; chairman of the administrative board of the National Anti-Tuberculosis Association of China in 1934; in charge of the department of anatomy at the Harvard Medical School of China, 1915-1916; he was an orthopedic assistant in the outpatient department of the Carney Hospital, Children's Hospital, and the Massachusetts General Hospital, Boston, 1916 and 1917; formerly was in charge of orthopedic surgery at Peiping Union Medical College; professor of orthopedic surgery, Medical Department of St. John's University; associate professor of orthopedic surgery, Woman's Christian Medical College; visiting orthopedic surgeon at the Margaret Williamson Hospital, Shanghai, and consulting orthopedic surgeon at the Soochow Hospital, Soochow; honorary superintendent of the Chinese Infectious Diseases Hospital; superintendent and chief surgeon of the Orthopedic Hospital of Shanghai, which he founded in 1928; aged 44; died, May 4.

Charles Breckenfeld Jones ○ Sacramento, Calif.; University of California Medical Department, San Francisco, 1906; fellow of the American College of Surgeons; on the staffs of the Mercy and Sutter hospitals; surgeon to the Western Pacific Railroad Company; local surgeon to the Pacific Telephone and Telegraph Company; consulting surgeon to the Sacramento Northern Railway; aged 57; died, March 14.

George Standish Dickinson, Erie, Pa.; Jefferson Medical College of Philadelphia, 1893; member of the Medical Society of the State of Pennsylvania and the American Gastro-Enterological Association; past president of the Erie County Medical Society; president, and for many years a member of the board of health; formerly on the staff of the Hamot Hospital; aged 66; died, March 10, of coronary thrombosis.

Charles McClure Doland ● Spokane, Wash.; University of Pennsylvania Department of Medicine, Philadelphia, 1903; member of the North Pacific Surgical Association; past president of the Spokane County Medical Society; fellow of the American College of Surgeons; veteran of the Spanish-American War; on the staff of the Sacred Heart Hospital; aged 59; died, March 13.

Archibald Magill Fauntleroy ● Medical Director, Captain, U. S. Navy, retired, Ossining, N. Y.; University of Virginia Department of Medicine, Charlottesville, 1901; entered the navy in 1901 and retired in 1921; served during the World War; fellow of the American College of Surgeons; aged 60; died, April 13, at the Harkness Pavilion of the Presbyterian Medical Center, New York.

Charles Freeman Halsted, Somerville, N. J.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1890; University of the City of New York Medical Department, 1890; member of the Medical Society of New Jersey; member of the staff of the Somerset Hospital; aged 68; died, March 8, of pulmonary embolism and arteriosclerosis.

Millard Langfeld, Omaha; Johns Hopkins University School of Medicine, Baltimore, 1898; at one time assistant professor of medicine at the Creighton University School of Medicine; formerly city health director; author of a book entitled "Infectious and Parasitic Diseases"; aged 64; died, March 22, of essential hypertension, chronic nephritis and uremia.

Albert Harrison Hill ● Mifflinburg, Pa.; Medico-Chirurgical College of Philadelphia, 1901; member of the local board of health and medical inspector for the schools of Mifflinburg; aged 59; died, March 28, in the Geisinger Memorial Hospital, Danville, of perforated duodenal ulcer and subdiaphragmatic abscess.

Thomas F. Higgins, Elizabeth, N. J.; College of Physicians and Surgeons, Baltimore, 1908; member of the Medical Society of New Jersey; for many years city physician; on the staffs of the Elizabeth General Hospital, St. Elizabeth's Hospital and the Alexian Brothers' Hospital; aged 57; died, March 24, of pneumonia.

Wilder De Wolfe Hubbard, Florence, Ala.; College of Physicians and Surgeons of Chicago, 1895; member of the Medical Association of the State of Alabama; formerly secretary of the Lauderdale County Medical Society; for many years county health officer; aged 65; died, March 25, of angina pectoris.

Robin William Cummins Francis, Westerville, Ohio; Medical College of Ohio, Cincinnati, 1898; member of the Ohio State Medical Association; formerly demonstrator of anatomy at his alma mater; served during the World War; aged 66; died, March 14, in a hospital at Washington, D. C.

Hiram Clayton Finch ● Pulaski, Iowa; Medical College of Indiana, Indianapolis, 1881; Chicago Medical College, 1890; an Affiliate Fellow of the American Medical Association; past president of the Davis County Medical Society; aged 82; died, March 7, in Bloomfield, of cerebral hemorrhage.

Arthur Frederick Jackle, New York; University of Buffalo School of Medicine, 1907; member of the Medical Society of the State of New York and the American Academy of Ophthalmology and Oto-Laryngology; aged 55; died, March 6, in Pasadena, Calif., of pneumonia.

Stephen Masury Gordon, Fall River, Mass.; Harvard University Medical School, Boston, 1885; member of the Massachusetts Medical Society; formerly on the staffs of the Fall River Union Hospital and the Fall River City Hospital; aged 78; died, March 20.

Waldo Milton Gaines, Sidney, Ohio; Central College of Physicians and Surgeons, Indianapolis, 1905; member of the Ohio State Medical Association; president of the medical staff of the Wilson Memorial Hospital; aged 64; died, March 16, of cerebral hemorrhage.

Robert Franklin Foster, Detroit; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1903; member of the Michigan State Medical Society; aged 66; member of the staff of the Highland Park (Mich.) Hospital, where he died in March.

Auguste Guertin, Nashua, N. H.; School of Medicine and Surgery of Montreal, 1892; member of the New Hampshire Medical Society; member of the staff of the Memorial Hospital and formerly on the staff of St. Joseph's Hospital; aged 70; died, March 7.

Ashley Darling James, Choctaw, Ala.; Medical Department of the University of Alabama, Mobile, 1901; member of the Medical Association of the State of Alabama; secretary of the Choctaw County Medical Society; aged 60; died, March 25.

Howard Conner Dunham ● Sulphur, Okla.; Tulane University of Louisiana School of Medicine, New Orleans, 1930; on the staffs of the Murray County Hospital and Clinic and the Soldiers Tubercular Sanatorium; aged 35; was found dead, March 15.

William Preston Hoy, Petersburg, Va.; University College of Medicine, Richmond, 1899; member of the Medical Society of Virginia; on the staff of the Petersburg Hospital; aged 61; died, March 23, in the Lankenau Hospital, Philadelphia.

John S. Hasty, Lamar, Colo.; Drake University College of Medicine, Des Moines, Iowa, 1887; St. Louis College of Physicians and Surgeons, 1891; formerly member of the state board of health; aged 76; died, March 19, in a hospital at Denver.

George Beggs Crews ● Denver; Chicago Medical College, 1883; at one time a medical missionary in China; formerly professor of pharmacology at the Denver and Gross College of Medicine; aged 80; died, March 11, of arteriosclerosis.

John R. Graves, Zebulon, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1897; member of the Medical Association of Georgia; aged 66; died, March 30, in Chapel Hill, N. C., of cerebral hemorrhage and chronic nephritis.

Frederick Prentiss Glazier, Hudson, Mass.; Boston University School of Medicine, 1883; formerly member of the state legislature, the school committee and board of health; aged 77; died, March 23, in the Hahnemann Hospital, Worcester.

John W. Hawkey, Bloomingdale, Mich.; Medical College of Fort Wayne, Ind.; 1882; member of the Michigan State Medical Society; aged 78; died, March 16, in the City Hospital, South Haven, of carcinoma of the stomach.

William Robert Alway, Waterford, Ont., Canada; M.B., University of Toronto Faculty of Medicine, 1897; M.D., Trinity Medical College, Toronto, 1897; formerly medical health officer; aged 65; died, March 25.

Irving Lloyd Carpenter, Manchester, N. H.; Harvard University Medical School, Boston, 1890; member of the New Hampshire Medical Society; at one time city and county physician; aged 70; died, March 15.

Frederick Jerome Doherty, Medical Lake, Wash.; Trinity Medical College, Toronto, Ont., Canada, 1903; member of the staff of the State Custodial School; aged 58; died March 18, of heart disease.

David Kapp ● Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1906; aged 51; on the staff of the Jewish Hospital, where he died, March 19, of carcinoma of the prostate.

Charles McIntosh Burroughs, Sudbury, Ont., Canada; University of Toronto Faculty of Medicine, 1911; member of the Associated Anesthetists of the United States and Canada; aged 51; died, March 14.

John Logan Fleek, Brodhead, Wis.; Rush Medical College, Chicago, 1895; past president of the Green County Medical Society; aged 75; died, March 21, of chronic myocarditis and pulmonary tuberculosis.

Millard Francis Cupp, Clarksburg, Ind.; Medical College of Ohio, Cincinnati, 1882; member of the Indiana State Medical Association; aged 78; died, March 22, of endocarditis and arteriosclerosis.

Marvin Ward Dupree, Athens, Ala.; Medical College of Alabama, Mobile, 1903; member of the Medical Association of the State of Alabama; aged 57; died, March 13, of carcinoma of the stomach.

John O. Gaston, Rochester, Mich.; Detroit College of Medicine, 1904; at one time health officer of Accomac County, Va.; aged 58; died, March 27, of chronic myocarditis and nephritis.

Andrew Howard Fuller ● West Upton, Mass.; Baltimore Medical College, 1906; aged 69; died, March 13, in the Memorial Hospital, Worcester, of injuries received in an automobile accident.

Robert Lee Glascock, San Antonio, Texas; University of Louisville (Ky.) Medical Department, 1902; served during the World War; aged 68; died, March 23, of cerebral hemorrhage.

Maxwell Vidaver, New York; Bellevue Hospital Medical College, New York, 1898; aged 60; died, March 5, in the Mount Sinai Hospital, of perforated peptic ulcer and peritonitis.

Charles Edward Mackey, Boston; Tufts College Medical School, Boston, 1919; member and formerly chairman of the city school committee; aged 43; was shot and killed, March 25.

William Norman Cowles ● Cataumet, Mass.; Harvard University Medical School, Boston, 1887; aged 74; died suddenly, March 28, of coronary occlusion and arteriosclerosis.

Ottocar E. Kopetschny, Jersey City, N. J.; University of the City of New York Medical Department, 1886; aged 75; died, March 23, of Hodgkin's disease and arteriosclerosis.

John W. Harper, Hampton, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1897; member of the Medical Association of Georgia; aged 62; died, March 22.

George Leonard Baber, Winnsboro, Texas; Atlanta College of Physicians and Surgeons, 1906; member of the State Medical Association of Texas; aged 55; died, March 3.

E. Curtis Gevedon, Grassy Creek, Ky.; Kentucky School of Medicine, Louisville, 1894; formerly member of the board of education; aged 66; died, March 14, of pneumonia.

Theophile Albert Combre, Lake Charles, La.; Meharry Medical College, Nashville, Tenn., 1917; aged 46; died in March at Kerrville, Texas, of pulmonary tuberculosis.

Israel Isaac Bernstein, New York; Baltimore Medical College, 1906; for many years on the staff of the Bronx Hospital; aged 58; died, March 9, in Miami Beach, Fla.

George Dean Ferguson, West Hartford, Conn.; University of the City of New York Medical Department, 1879; aged 80; died, March 19, of coronary thrombosis.

William Henry Doty, Sanderson, Texas; Memphis (Tenn.) Hospital Medical College, 1900; aged 66; died in March, at a hospital in Del Rio, of pneumonia.

Francis R. Lane, Sheffield, Mass.; Columbian University Medical Department, Washington, D. C., 1885; aged 78; died, March 28, of carcinoma of the prostate.

Stephen Keyes Williams, Detroit; Michigan College of Medicine and Surgery, Detroit, 1906; served during the World War; aged 56; died suddenly, March 1.

William Casey Ingram, Lanagan, Mo.; Vanderbilt University School of Medicine, Nashville, Tenn., 1893; also a druggist; aged 73; died suddenly, March 12.

David H. Wood, Coldwater, Mich.; Detroit Medical College, 1876; Civil War veteran; formerly member of the board of education; aged 91; died, March 1.

Baxter Clyde Culler, Martinsville, Va.; Tulane University of Louisiana School of Medicine, New Orleans, 1922; aged 38; died, March 15, of lobar pneumonia.

W. Jonathan Kiefer, Lebanon, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1890; aged 71; died, March 24, of cerebral hemorrhage.

Paul Francis Ela, Manchaug, Mass.; Harvard University Medical School, Boston, 1894; aged 74; died, February 19, at the Whitinsville (Mass.) Hospital.

Artemus Daniel Killian, Tuscaloosa, Ala.; University of the South Medical Department, Sewanee, Tenn., 1901; aged 65; died in March of pneumonia.

Walter Bruce Bannerman ● East Bridgewater, Mass.; University of the South Medical Department, Sewanee, Tenn., 1903; aged 59; died, February 27.

Henry Hanson ● Kirkwood, Mo.; Missouri Medical College, St. Louis, 1889; aged 79; died, March 7, in the Barnes Hospital, St. Louis, of uremia.

Paul Kase Jr., ● Northwood, Iowa; University of Michigan Medical School, Ann Arbor, 1931; aged 33; died suddenly, March 21, of heart disease.

Frank Philip Zerfass ● Hamilton, Ohio; Medical College of Ohio, Cincinnati, 1903; on the staff of the Mercy Hospital; aged 60; died, February 3.

Leonard Francis Cruse, Osage City, Mo.; Marion-Sims College of Medicine, St. Louis, 1897; aged 59; died, March 20, of cerebral hemorrhage.

George Davis, Beaufort, N. C.; Kentucky School of Medicine, Louisville, 1894; also a lawyer; aged 62; died in March of Hodgkin's disease.

Michael Evans Cole, Philadelphia, Miss.; Mississippi Medical College, Meridian, 1907; aged 54; died in March at a hospital in Meridian.

Loretta Mann Hammond, Santa Ana, Calif.; Woman's Medical College of Pennsylvania, Philadelphia, 1871; aged 94; died, February 13.

Oscar L. Woodall, Iowa Park, Texas; Louisville (Ky.) Medical College, 1894; served during the World War; aged 70; died, March 4.

Henry R. Hoover, Wilson, N. C.; Baltimore Medical College, 1891; aged 76; died, March 16, of a self-inflicted bullet wound.

Jay Stiles, Lena, Ind.; Ohio Medical University, Columbus, 1898; aged 69; died, March 12, in the Putnam County Hospital, Greencastle.

Mae Sherer Harris, St. Louis; Eclectic Medical University, Kansas City, 1901; aged 68; died, March 22, of intestinal obstruction.

Francisco R. de Goenaga, San Juan, P. R.; Universidad de Santiago Facultad de Medicina, Spain, 1878; aged 80; died, March 1.

Thomas H. Diven, St. Louis; Marion-Sims College of Medicine, St. Louis, 1895; aged 67; died, March 22, of pneumonia.

Benjamin Frederick Preston, Farmington, Ga.; Eclectic Medical Institute, Cincinnati, 1908; aged 61; died, February 3.

Robert D. Flippen, Pilot Mountain, N. C.; Louisville (Ky.) Medical College, 1892; aged 65; died suddenly, March 24.

Elkanah B. Head, Franklin, Ky.; University of Nashville (Tenn.) Medical Department, 1870; aged 88; died, March 16.

Andrew Hamilton Miller, Hamilton, Ont., Canada; Trinity Medical College, Toronto, 1877; aged 88; died, February 10.

Homer Head, Dahlonega, Ga.; University of Georgia Medical Department, Augusta, 1900; aged 70; died, March 10.

Theodore E. Hoyt, Hondo, Calif.; Jefferson Medical College of Philadelphia, 1879; aged 88; died, March 22.

Alfred Jonathan Downs ● Los Angeles; Jefferson Medical College of Philadelphia, 1901; aged 60; died, March 12.

Henry Evans Thompson, Senecaville, Ohio; Ohio Medical University, Columbus, 1900; aged 75; died, February 7.

John Evan Engstad, Grand Forks, N. D.; Rush Medical College, Chicago, 1885; aged 78; died, February 19.

James E. Gray, Danville, Ohio; Illinois Medical College, Chicago, 1898; aged 72; was found dead, March 4.

Warren Riley Stateler, Dupont, Ohio; Kentucky School of Medicine, Louisville, 1893; aged 72; died, March 2.

Howell Cobb Strickland, Gillsville, Ga.; Atlanta Medical College, 1890; aged 76; died, February 26.

Samuel C. Balch, Etiwanda, Calif. (licensed in Illinois in 1877); aged 86; died, March 11.

B. N. Spears, Junction City, Ark. (licensed in Arkansas in 1903); died, February 20.

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Bureau of Investigation

SEX AND GLAND REJUVENATORS

Postmaster General Clamps Down on Mail Order Frauds

The United States Post Office Department has recently clamped down on several concerns exploiting gland remedies of the sexual rejuvenation type.

BERLIN PRODUCTS COMPANY

On March 22, 1937, the Acting Postmaster General, Harllee Branch, issued a Post Office fraud order against the Berlin Products Company, the Atlas Products Company, the Atlas Products, and their officers and agents, of Chicago.

According to the fraud order, a Mr. Charles S. Thompson sold through the mails preparations called "Prescription No. 25" and "Prescription No. 40," for sexual deficiencies and allied conditions in men and women. The enterprise was started in August 1936 by J. Walker Jones, who, after two weeks' operation, sold it to the present proprietor.

Victims for the nostrums were obtained by newspaper and periodical advertisements. One such advertisement read:

"FOR MEN AND WOMEN
MAKE THIS TEST AT OUR RISK

"Don't feel old. Be young at 60. Help your glands by using famous doctor's own guaranteed private prescriptions of proven merit . . . Prescription No. 25 for men, and prescription No. 40 for women. These prescriptions assist nature in restoring the prostate, ovaries and other glands of the body to normal activity. Harmless and effective. Price $1.00, super strength, $4.00. If C. O. D., postage extra.

MONEY-BACK-GUARANTEE

After 6 days trial, if you are not satisfied, return the unused portion of the medicine and your money will be returned. You be the judge.
BERLIN PRODUCTS CO., 454 E. 42nd St., Dept. 4, Chicago, Ill."

The promoter advised the post office inspector who investigated the case that the formula for the preparations is as follows:

Prescription No. 25, Orchic Substance, prostate substance, ext. nux vomica, ext. yohimbin, and zinc phosphide.

Prescription No. 40, Ovarian substance and pituitary substance.

The therapeutic effects of the active ingredients are well known to the medical profession. Substances such as are contained in Prescription No. 25 have no value in restoring the prostate to normal or rejuvenating sexual vigor. The claims made for Prescription No. 40 for women were also held to be false.

BIO-CHEMICAL LABORATORIES, LTD.

The Bio-Chemical Laboratories, Ltd., the Laboratori Biochimici, S. A., the Laboratories Biochemiques, S. A., and the Biochemische Laboratorien, A. G., of Locarno and Melano, Switzerland, had the United States mails closed to them on April 6, 1937, for selling through the United States mails a fraudulent "gland treatment" called "Bulltone," a "Sexual and Nerve Tonic for men."

According to the fraud order, a chemical analysis of the preparation showed that it consisted "essentially of animal or glandular matter, kola nut and yohimbin."

Yohimbin at one time was thought to have value in sexual impotence but has long since been discarded by the medical profession.

The post office authorities held that it was false to claim that Bulltone was a proper treatment for "all stages and forms of sexual debility, nervous derangements, general weakness, loss of memory, increased liability to tiredness, neurasthenia."

ZION HOLY SPIRITUAL MISSION

On April 7, 1937, the Postmaster General closed the mails to the Zion Holy Spiritual Mission; Zion Holy Spiritual Laboratories; Zion Holy Spiritual Mission Laboratory; Rev. E. N. French, D.D.; Rev. E. N. French, D.D., Manager; Rev. Dr. E. N. French, Spiritual Adviser; Rev. Dr. E. N. French, Spiritual Adviser and Bishop; Zion Holy Spiritual Mission Distributing Auxiliary, and their officers and agents as such.

The "Rev. E. N. French, D.D.," a thirty-five year old British West Indian Negro, operated a combination mail order business and a so-called "mission" in Chicago. According to the post office report, 75 per cent of his mail order business consisted of the sale of a preparation called "Bry-o-lyn" for "blood trouble," lost manhood and various other diseases and ailments. The versatile Rev. French also sold a "kidney and bladder treatment," a "bowel" preparation, an alleged remedy for piles, a corn treatment, and various talismanic seals.

Bry-o-lyn, the leader of the French preparations, was analyzed by the Food and Drug Administration and shown to contain "iron, emodin and small quantities of ammonium, magnesium, sodium, potassium sulfate and chloride." It was essentially an iron solution containing saline laxatives and was, of course, wholly worthless for the diseases and ailments for which it was recommended.

The kidney and bladder nostrum was found to contain copaiba, potassium nitrate, emodin, magnesium, iron sulfate and carbonate. The pile medicine consisted of a white salve containing a small percentage of calomel, phenol and boric acid.

French, the post office evidence shows, is not a physician, chemist or pharmacist; neither had he ever been ordained as a minister.

WEST COAST SPECIALTIES COMPANY

The West Coast Specialties Company, Pacific Coast Specialties Company, and their officers and agents as such at Portland, Ore., were found by Acting Postmaster General Howes on April 27, 1937, to be conducting a scheme for obtaining money through the mails by means of false and fraudulent pretenses, representations and promises.

According to the post office report, the West Coast Specialties Company and the Pacific Coast Specialties Company are names used by a J. E. Tryzelaar in the sale through the mails of a "marvelous secret." The "secret" was represented as enabling the possessors to retain their youthful appearance and vigor regardless of age and to overcome various diseases and ailments incident to advancing years.

Patronage was attracted through advertisements of the "Be Young at 60" type. Among other representations was the "gag" used by practically all food faddists that the ordinary diet lacks certain vital food elements. "Absence of this unusual food element in the daily diet is the chief cause of premature old age, graying or falling hair . . . mental depression . . . hardening of the arteries and high blood pressure."

The gullible who made remittances received a single, letter-size, printed sheet containing the "Vital Health Secret." The secret seemed to be that ". . . iodine is essential for the health of man," and some rambling phrases purporting to show the incidence of iodine deficiency and goiter.

Iodine, therefore, in varying doses, was recommended as an old age preventer and as a means of eliminating gray or falling hair, wrinkles, facial lines, sagging muscles in the face and neck, pyorrhea, tooth decay, poor circulation and various other ailments. The medical evidence introduced by the post office authorities failed to concur that iodine possessed such marvelous therapeutic properties, and the Postmaster General closed the mails to the aforementioned concerns and parties.

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE: The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the composition; (4) the type of nostrum; (5) the reason for the charge of misbranding and (6) the date of issuance of the Notice of Judgment—which may be considerably later than the date of the seizure of the product.]

Golden Brown Ointment.—McKesson-Van Fleet-Ellis Corp., Memphis. Composition: Essentially petrolatum with 10 per cent of mercuric oxide. For eczema, rash, pimples, skin discolorations, etc. Fraudulent therapeutic claims.—[*N. J. 21078; September, 1934.*]

Men-tho-lo.—Leighton Supply Co., Pittsburgh. Composition: Essentially menthol and wintergreen in a mixture of petrolatum, paraffin, starch and water. For toothache, asthma, rheumatism, catarrh, piles, etc. Fraudulent therapeutic claims.—[*N. J. 24034; November, 1935.*]

Ray-X.—Ray-X Corp., no address given. Composition: A water containing minute proportions of salts in solution. Cure-all. Fraudulent therapeutic claims.—[*N. J. 24047; November, 1935.*]

Correspondence

"MACHINE FEVER" IN SYPHILIS

To the Editor:—In the May issue of the *Reader's Digest* is a condensation of an article entitled "Machine Fever," by Paul de Kruif, which appeared originally in the *Country Gentleman* for April. The condensed article in the *Reader's Digest* contains one sentence at the beginning of the second paragraph on page 109 which reads "No longer, then, need a victim of early syphilis come once a week for almost two years for treatment with the standard arsenic and bismuth dosage." I must confess that I am disturbed by the implications of this detached sentence, particularly since it bears on certain experimental studies which we have carried out at the Kettering Institute for Medical Research in Dayton.

In the original article by de Kruif, he described accurately and in some detail the character and extent of the experimental studies on the treatment of early syphilis with artificial fever therapy combined with chemotherapy. De Kruif stated that these experiments had extended only over four years and had involved only thirty-two patients. To quote from the original article in the *Country Gentleman:* "All these thirty-two have been given the now safe, practical machine fever; and at the same time small, safe shots of arsenic and bismuth drugs are injected to reinforce the fever's power. This test has been in progress only four years; *it is still strictly experimental;* and it is true that syphilis is of all plagues the longest, sneakingest, most treacherous. . . ."

In our publications in medical literature we have emphasized repeatedly the purely experimental character of the application of artificial fever therapy as an adjunct to chemical therapy in the treatment of early syphilis. While there is no longer any valid reason to doubt the efficacy of fever therapy in the treatment of syphilis of the central nervous system, it would be extremely illogical and indiscreet to intimate at this preliminary stage of the experiment that this method of treatment should be regarded as a tried and proved procedure for the treatment of *early* syphilis. The standard schema of continuous chemical treatment as outlined by Surgeon General Thomas Parran and the other members of the Cooperative Clinical Group of the U. S. Public Health Service provides, without question, the best method for the mass attack on the enormous number of cases of early syphilis which occur each year in this country. Furthermore, the remarkable results which have been achieved in the nation-wide programs for the eradication of syphilis in Denmark, Sweden and Great Britain leave little doubt as to the efficacy of controlled and adequate chemical therapy in the mass-management of the disease.

Even in the few cases of early syphilis in which artificial fever therapy has been combined with chemotherapy the patients have received injections of arsenic and bismuth preparations for several months. It will require many more years of diligent experimentation before the combined artificial fever-chemical method of treatment of early syphilis is established as sound practice or rejected. The constant development of simpler and safer methods for the production of artificial fever should stimulate vigorous inquiry of the possibility that the time, effort and expense involved in the adequate therapy of early syphilis may be greatly lessened. Such studies should be restricted to those large clinics in which adequately trained personnel may engage in long-term, controlled experiments.

There are no tried and proved "short cuts" to the treatment of syphilis. To create such an impression would be to declare a Roman holiday for the charlatan.

Walter M. Simpson, M.D., Dayton, Ohio.
Director, Kettering Institute for Medical Research, Miami Valley Hospital.

EDUCATIONAL LANGUAGE TEST FOR PHYSICIANS

To the Editor:—In The Journal, Oct. 3, 1936, in a communication entitled "Vocabulary of Physicians and Aptitude Tests," there is a list of words from Garrison's History of Medicine used in the aptitude tests.

I hate to admit it but there were many that I had never seen before, so I began looking the definitions up in Funk and Wagnalls, Webster's latest unabridged Dictionary, and Dorland's seventeenth edition of the Medical Dictionary, 1936, and was unable to find definitions for six of the 131 words.

I presume they are scientific words occurring in biology or botany, but certainly they should be in one of these three dictionaries. Would you kindly tell me the definition of the following, or where to find them: farago, marano, mascaron, paracutic, vao and espalier?

It would be interesting to find how many physicians many years in practice could define these words.

C. C. Owen, M.D., San Bernardino, Calif.

Comment.—Farago: A Spanish word equivalent to fardo, which means a bundle.

Marano: A Jew or a Moor who, during the persecution by the Spanish Inquisition, publicly professed Christianity but privately adhered to his own religion (Standard Dictionary).

Mascaron: A grotesque mask (Standard Dictionary).

Paracutic: Probably an adjective from the noun paracusis, in which case it would refer to any perversion of hearing.

Vao: An arrow poison from the United States of Colombia, containing corrovaline; supposed to be adulterated corroval (Foster's Medical Dictionary).

Espalier: A trellis on which to train the branches of fruit trees (Standard Dictionary).—Ed.

ORTHOSTATIC HYPOTENSION

To the Editor:—There is an importance in the article on "Orthostatic Hypotension: The Treatment of Two Cases with Benzedrine Sulfate," by Perk Lee Davis and Margaret Shumway-Davis, in The Journal, April 10, page 1247, which should be recognized and applauded. This importance lies in the fact that the authors have used a comparatively unknown function of the circulation to determine the effect of a drug. This function of the circulation is its "gravity resisting ability." The symptom that reveals its weakness is "postural" or "orthostatic hypotension." This is measured by comparing the blood pressure lying down with the blood pressure while standing. Postural or orthostatic hypotension (first called blood ptosis) is measured by the amount of fall of blood pressure on standing. The systolic pressure moves more than the diastolic. Differences may amount to as much as from 80 to 100 mm. on standing, and in postural hypotension there may be high blood pressure lying down, low blood pressure standing up.

Postural hypotension has been noted by Ghrist and Brown (*Am. J. M. Sc.* **175**:336 [March] 1928), by Bradbury and Eggleston (*Am. Heart J.* **1**:73, 1926), Sewall (*Am. J. M. Sc.* **1**:491 [April] 1916) and perhaps earliest in America by me (*M. News* **87**:529 [Sept. 16] 1905; *New York M. J.*, November, 1913; *Am. J. M. Sc.* **160**:721 [Nov.] 1920). Bradbury and Eggleston considered postural hypotension an illness and sought remedies, finding none that would adequately affect the symptom. Ghrist and Brown, at the Mayo Clinic, reported successful treatment by ephedrine sulfate. I have found that digitalis and squill will favorably affect some cases, notably chronic hypotension (Mosenthal, H. O.: Diagnosis and Treatment of Variations in Blood Pressure, Oxford University Press, p. 60. Crampton, C. W.: *New York State J. Med.* **36**:1087 [Aug. 1] 1936).

The obvious result of these observations has been that certain drugs — digitalis, squill, ephedrine — will favorably affect

postural hypotension. The Davises have added benzedrine sulfate. In this use of postural hypotension as a test of the efficiency of the drug they have added an item of importance to the careful work in clinical observations in the effect of benzedrine sulfate by Wilbur, MacLean and Allen (*Proc. Staff Meet., Mayo Clin.* **12**:97 [Feb. 17] 1937), who as yet have not reported on the effect on this significant symptom, which is now, I understand, under way at Rochester. The less obvious but most important fact is revealed that there is now a method of finding out more about the effect of drugs than before; they can be calibrated as to their effect on a factor of circulatory efficiency essential to life and, shown by postural hypotension, this is different from pulse rates and all blood pressures considered singly.

I have repeatedly urged the use of this symptom for pharmaceutic assay and welcome the work of the Davises. Let others follow.

C. WARD CRAMPTON, M.D., New York.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

WAS A DIAGNOSIS OF SYPHILIS JUSTIFIED?

To the Editor:—In December 1930, on the basis of a single four plus Kahn reaction, a diagnosis of syphilis was made in the case of a white man, aged 26, single. There was no history of exposure or evidence of a primary lesion. No familial history or congenital stigmas of syphilis could be ascertained. The patient has continued well and healthy on active duty in military service. His conduct is exemplary. Treatment to date has consisted of forty-nine injections of neoarsphenamine, fifty-five of bismuth compounds, seventy mercury injections or inunctions, and an indeterminate amount of mixed treatment and potassium iodide by mouth. Twenty-five serologic tests have been performed (Kahn and Wassermann). These have ranged the scale from 0 to 4 plus with no apparent relation to treatment. Two spinal fluid examinations have been negative. The Bureau of Medicine and Surgery, United States Navy, disapproves establishing a diagnosis of syphilis by means of serologic positivity alone. The institution of treatment beclouds the issue as to the true diagnosis ever being definitely known. False positive serologic results do occur. Within the past two years I have seen them reported in cases of influenza, malaria and vaccinia. Syphilis has been ruled out in these cases by the prolonged observation of various medical officers. The serologic reaction returned to negative without treatment. The spinal fluids were normal. The person involved craves assurrance that he is nonsyphilitic. In view of the fluctuating serologic reaction I have hesitated, though it would appear that adequate treatment has been given. My advice has been to watch and wait. I would greatly appreciate your opinion as to the validity of the diagnosis, whether further treatment is indicated and how you would advise this patient.

M.D., Florida.

ANSWER.—This inquiry involves two points for discussion: (1) the issue of nonspecific or falsely positive serologic tests and (2) the question of latent syphilis. In regard to the first point, since the advent of the flocculation tests clinicians have been confronted with "weak positive" reports in patients who have neither signs nor symptoms nor a history of syphilis. This type of report is encountered in patients who have systemic disease not of syphilitic nature as well as in those who are apparently perfectly well. The majority of serologists are loath to accept the idea that such reports may be falsely positive, and many clinicians will not accept such reports as diagnostic of syphilis. In a sense both the clinician and the serologist are right because these "weak positive" reports are encountered in persons known to have syphilis and on the other hand they have also been reported during the menstrual period, in association with endocarditis, cutaneous and glandular tuberculosis, lymphoblastoma, and during numerous febrile states. The interpretation of these reports, especially when numerous tests are done with variations in the degree of positivity, is difficult. It is suggested that, when inconclusive reports are obtained from one laboratory in this way, a specimen of blood be drawn not sooner than eight hours after the patient has eaten and divided so that it can be placed in two or three test tubes and sent to two or three different laboratories for examination. This permits all the laboratories to examine the same specimen. The majority of these reports should be accepted as authentic.

The diagnosis of syphilis was accepted and treatment was given in 1930, and the patient is now clinically negative; the spinal fluid is negative but there are variations in the serologic report. If we accept the original diagnosis as correct, the patient is in the latent phase of syphilis and should be treated with two courses of bismuth compounds a year for several years to come. It is not possible from the data furnished to determine accurately now whether the patient ever had syphilis, as the facts that he is clinically negative and his present physician feels that the reports are false positives are not sufficient reasons to discard the original diagnosis as made in 1930. In fact, the responsibility of the diagnosis rests on the physician who accepted the report and started treatment, and there is not sufficient evidence available now to say that he was in error.

The opinion expressed that a diagnosis of syphilis should not be made on the basis of positive serologic tests alone is not warranted if for no other reason than the fact that patients in whom the diagnosis of syphilis was supported by clinical manifestations may develop latency and remain serologically positive indefinitely. When such cases are encountered for the first time, the serologic evidence confirmed by repeated tests in an accredited laboratory is the only basis for the diagnosis of syphilis.

It is readily understood why the inquirer is loath to accept the diagnosis of syphilis now and why he believes the reports are not authentic. Similar problems are encountered frequently by syphilologists, and in the future, as the serologic tests become more sensitive, more confusion will be created in the minds of physicians who encounter patients with syphilis occasionally because more falsely positive tests will be reported. Sometimes our sympathy for the individual involved will sway our judgment and lead to the ignoring of an authentic positive test, an offense as serious as treating an individual because of a falsely positive test.

Accordingly, it would seem wise to accept the diagnosis as made in 1930 and to continue with bismuth treatment and observation. Further repetition of the spinal fluid test is not necessary. Following an observation period of three years, if no clinical symptoms appear, the patient may marry if he so wishes.

LYMPHEDEMA OF LEG

To the Editor:—A white woman, aged 28, came to me complaining of swelling of her right leg from the ankle to approximately 4 inches below the knee. In April of this year she had erysipelas of this area, which was treated by violet ray and in due time disappeared. However, after the erysipelas was apparently cured she began to notice that the leg would swell, especially with standing or walking. After a night's rest in bed the leg would be of normal size, but within three hours after she resumed activity the swelling would reappear. The remainder of the physical examination was negative and the past history was negative. She has used hot epsom salt packs to this area, infra-red radiation, ultraviolet rays and high voltage roentgen therapy. She has had no treatment for three weeks but still complains of and exhibits swelling of this leg. Can you suggest any medication or treatment that I might give her to relieve this condition? Please omit name.

M.D., Ohio.

ANSWER.—Apparently the patient had acute lymphangitis and cellulitis in April, which was followed by lymphedema. Acute lymphangitis and cellulitis produce lymphedema by effecting thrombosis of the lymph vessels, which produces lymph stasis, which in turn causes an overgrowth of connective tissue and obstruction of the lymphatics. While one cannot determine the etiology of the episode of acute inflammation from the history of this case, one should always suspect trichophytosis, as this condition is responsible for single or recurrent episodes of acute lymphangitis and cellulitis of the lower extremities in a considerable number of cases.

The treatment consists in active treatment of trichophytosis, if this condition is present, and prevention of the edema by adequate bandaging. An important first step is elevation of the extremity until as much as possible of the lymph has been removed from the extremity. Cloth bandages are of little or no value; the support which they give is of little value. Elastic stockings are unsatisfactory in many instances, for the same reason; they tend to stretch and lose their elasticity. Adhesive bandages are somewhat more efficient than the previously mentioned supports. The entire criteria for establishing the value of any type of support is control of edema; a support that does not prevent swelling, when the patient is active, is valueless; one that prevents swelling is adequate. A pure rubber roller bandage, 3 inches wide and 15 feet long, is preferable. Of the three weights available, the proper one prescribed for any specific patient depends on the difficulty in controlling the edema. Ordinarily, the bandage is applied over a lisle stocking, beginning by making two turns about the foot, two figure-of-eight turns about the ankle, and progressing up the extremity

to the knee. The toes and part of the heel are left exposed. The bandage should be removed and applied in the same manner each time, as it becomes shaped to the extremity on repeated use. If it is applied too tightly, the toes become discolored, cold and numb. If it is applied too loosely, edema results. Patients soon become adept at bandaging their legs efficiently. The bandage should be removed at midday and reapplied over a dry stocking after the patient has rested for an hour. The same procedure is repeated at night if the patient is active. If he remains home, he may remove the bandage and elevate the leg, while sitting. Patients object to wearing the bandages because of the inconvenience in applying them repeatedly, the slight discomfort, and their unsightly appearance. This is particularly true of women, who object to the appearance of the bandaged limb. Frequently a well fitting elastic stocking may be used for "dress" occasions, and the use of the heavier rubber bandage may be reserved for ordinary activity. It is well to point out to women that the lymphedematous leg has an abnormal appearance which the bandage increases but little, and to emphasize that uncontrolled edema almost invariably causes a gradual increase in the size of the limb. Information regarding how long the bandage should be worn is not available; in some instances it must be used indefinitely; in others, improvement in circulation of the lymph may occur. Once every month or so the bandage can be left off for a day as a trial. If edema reappears, the support must be worn again.

A detailed description of lymphedema is given by E. V. Allen and R. K. Ghormley in the *Annals of Internal Medicine* **9**:516 (Nov.) 1935.

TREATMENT OF SYPHILIS

To the Editor:—In December 1933 I began treating a white man, aged 27, for syphilis. He came to me with a rash of unknown origin on both arms. The body otherwise was normal. In 1927 he was treated for a primary lesion which healed, and for three years following the course of treatment the Wassermann reaction was negative (taken at six months intervals), at which time he was pronounced cured. The spinal Wassermann reaction also was negative. When I first saw him the Wassermann and Kahn reactions were four plus and the ensuing treatment and Wassermann reactions were as follows: January 6 and 12, 4 Gm. of neoarsphenamine; January 19 to March 3, seven 1 cc. doses of iodobismitol intramuscularly; March 9 to April 7, five doses of 0.4 Gm. of neoarsphenamine, Wassermann reaction four plus; April 18 to June 4, six doses of 2 cc. of bismuth subsalicylate in oil (0.4 Gm.) intramuscularly; June 18 to 30, 0.6 Gm. of neoarsphenamine (delayed reaction chill, abdominal cramps, diarrhea and temperature of 104, coming on six hours after injections); September 22 (Wassermann and Kahn reactions one plus and two plus respectively) to November 14, eight doses of 0.6 Gm. of neoarsphenamine; December 4 (Wassermann and Kahn reactions negative) to Jan. 16, 1935, five doses of 0.4 Gm. of bismuth subsalicylate in oil intramuscularly; June 4 (Wassermann and Kahn reactions both one plus) to July 24, six doses of 0.6 Gm. of neoarsphenamine; July 31 (Wassermann reaction four plus) to August 23, four doses of 0.4 Gm. of bismuth in oil; August 23 to October 17, mercury rubs three times weekly; October 17 to November 29, six doses of 0.4 Gm. of bismuth in oil; January 1936, Wassermann and Kahn reactions one plus; July 13 to Aug. 21, six doses of 0.06 Gm. of mapharsen; November 25 to November 4, four doses of 0.06 Gm. of mapharsen and four doses of 0.4 Gm. of a bismuth compound alternating (Wassermann reaction four plus, Kahn reaction three plus); November 14 to December 2, three doses of 1 Gm. of sodium thiosulfate intravenously; Jan. 8, 1937, to February 5, four doses of 0.04 Gm. of mapharsen; February 15 to March 10, four doses of 0.4 Gm. of bismuth in oil; March 18, Wassermann and Kahn reactions 4 plus. The patient's physical examination and reflexes are normal. His weight is 124 pounds (56 Kg.). The pupils are equal and regular; they react to light and in accommodation. The spinal Wassermann test has not been done. Kindly advise me whether treatment has been inadequate and, if so, what more can I do, as I am naturally anxious to get his patient cured if at all possible.

M.D., New Jersey.

ANSWER.—The treatment given this patient following his original infection has not been described. It is presumed, however, from the statement made that he was treated only until the primary lesion disappeared. The Wassermann test as a rule will revert to negative following approximately six injections of an arsenical compound, which probably accounts for the negative Wassermann reaction between 1927 and 1930.

The patient certainly has received adequate treatment by the correspondent from 1933 until the present time. The fact that the present Wassermann reaction is still four plus may be due to several factors. One of these factors may be the inadequate treatment given during the first two or three years following infection. Other factors that may produce a persistently positive blood Wassermann reaction are syphilis of the central nervous system, cardiovascular syphilis, bone syphilis and visceral syphilis. It is suggested that a spinal puncture be done to determine the reaction of the spinal fluid at this time. It is also suggested that a thorough medical examination, including roentgenologic study in order to eliminate cardiovascular syphilis, be made. Should all these procedures prove negative, it would seem probable that this is one of those unusual cases of Wassermann fastness with no clinical evidence of syphilis. In this case it is suggested that treatment be stopped but that the man be observed for several years, during which time frequent serologic and clinical check ups should be made.

ETIOLOGY AND TREATMENT OF ACNE OF FACE AND SHOULDERS

To the Editor:—What is the etiology of acne of the face and shoulders? A woman and her two daughters are suffering from this condition at intervals. The condition becomes more acute two days before the menstrual period and remains at the height clear through this period and two or three days following. The skin gradually returns to normal and remains so for about one week prior to the next period. These patients have been reading in the papers and magazines about wonderful results following the taking of yeast. Is this a purely allergic condition? If it is, how should I go about it to find out the cause and what is the value of yeast in these cases? Kindly advise general treatment. If place in THE JOURNAL, please omit name.

M.D., Illinois.

ANSWER.—Because of its usual advent at puberty, it has long been recognized that the development of the sex glands has much to do with the etiology of acne vulgaris. The exacerbations so often noticed at the menstrual periods as mentioned in the query emphasizes this relation. There are records of adrenal tumors in young children, accompanied by precocious sexual development and acne vulgaris.

Along with the development of hair at puberty, one can easily understand a stimulation of the sebaceous glands. Most cases of acne show abnormal activity of these glands; the skin of the face, perhaps of the back and chest, is greasier than normal. Some patients with superficial acne, however, have dry skins. It is therefore not only an increased function of the sebaceous glands that is at fault. Comedones are the forerunners of acne pustules and some cases of acne are manifested only by comedones. These are caused by an abnormality of horn formation in the outer layer of the skin. The horny layer grows at the mouth of the follicle, narrowing the orifice and preventing the semisolid sebum from being pushed out on the surface. The sebum distends the follicle just below its orifice into a bottle shape and hardens to form a solid plug. This may remain for a long time, collecting dirt on its surface, or it may soon, by acting as a foreign body, set up an irritation which results in an infiltrate of round cells, plasma cells, mast cells and giant cells. Eventually these are replaced by polymorphonuclear leukocytes and a pustule forms. This, if superficial, soon breaks, liberating the comedo and subsiding until another comedo forms. If deep, the pressure and toxins result in destruction of connective tissue and are healed by scar formation. Whether a qualitative change in the sebum has anything to do with the process is not known. Bromide and iodide internally set the process in action, as do oils or tars and tarlike substances applied externally. These may act directly on the horn-forming process in the skin or may act through changes in the sebum.

Rosenthal and Neustaedter measured the estrogen found in the blood of young girls with acne vulgaris. In only two of twenty-nine girls with normal menstruation who suffered with acne was a normal amount of estrogen found in the blood; that is, 1 mouse unit in 40 cc. of blood. In sixteen girls the amount was less than normal and in eleven there was none present. This, if substantiated by further study, will support the theory derived from clinical observation. (Rosenthal, Theodore, and Neustaedter, Theodore: Estrogenic Substance in the Blood of Patients with Acne, *Arch. Dermat. & Syph.* **32**:560 [Oct.] 1935.)

Lawrence and Feigenbaum tried to treat acne in youths of both sexes by administration of the gonadotropic principle derived from pregnancy urine. They were moderately successful, as others have been. Much more experience is necessary, however, before the method can be said to be an established success. (Lawrence, C. H., and Feigenbaum, Jacob: The Treatment of Acne Vulgaris with Pregnancy Urine Extract, *New England J. Med.* **212**:1213 [June 27] 1935. Lawrence, C. H.: The Anterior Pituitary-like Hormone: A Clinical Study of Its Effects in Acne Vulgaris, THE JOURNAL, March 21, 1936, p. 983.)

Hollander (Hollander, Lester: The Rôle of the Endocrine Glands in the Etiology and Treatment of Acne, *Arch. Dermat. & Syph.* **3**:593 [May] 1921) thinks that cases of acne can be classified as:

1. Hyperthyroid. Thin, anemic, with thyroid hyperactivity.

2. The ruddy, overnourished type with sluggish metabolism. He asserts that the condition in type 1 improves on the administration of adrenal cortex extract, of which he gives 0.3 Gm. three times daily for two weeks and then, if indicated, the same dose four times a day for two months. Type 2 patients are given thyroid, beginning with 0.015 Gm. three times daily

and cautiously increased. The value of the adrenal therapy has been attested by Pusey and Rattner.

Heredity, of course, plays an important part in the etiology of acne, for the character of the skin and the peculiar combination of the endocrine glands one possesses are derived from one's ancestors.

On this prepared soil, with comedones and excessive oiliness, accompanied often by seborrhea of the scalp, secondary causes produce marked results. Anemias, cachexias and toxemias of many kinds so reduce the resistance of the skin that pus is freely formed, resulting in some cases in severe exacerbations of the disease and lifelong deformity.

Constipation has an important contributory effect. Not seldom exacerbations of the disease can be traced to this cause. Irregular hours, lack of rest, overwork and anxiety over studies may play an important part.

Local infection of the skin as a specific cause of acne has been discredited by the work of many investigators. Lack of resistance to the always present staphylococcus explains pus formation sufficiently.

Gastric hypo-acidity has been blamed for acne, probably because improvement has occurred in some cases on treatment with dilute hydrochloric acid. Immerman investigated the stomach acidity in ninety-three cases of acne vulgaris and found no satisfactory evidence of abnormal gastric secretion. (Immerman, S. L.: Gastric Acidity in Acne Vulgaris, with a Consideration of Normal Gastric Acidity, *Arch. Dermat. & Syph.* **31**:343 [March] 1935.)

A pathologic sugar metabolism has also long been suspected of a rôle in the etiology of acne vulgaris. Crawford and Swartz studied ten cases of acne vulgaris; none showed abnormality of sugar metabolism and in five the condition actually improved on an increase of sugar in the diet. If further study should substantiate this report, one of the cardinal features of the dietary treatment of acne vulgaris would cease to have any scientific foundation. (Crawford, G. M., and Swartz, J. H.: Acne and the Carbohydrates, *Arch. Dermat. & Syph.* **33**:1035 [June] 1936.)

White writes of acneform eruptions of the face and claims to be able, by elimination diets as suggested by Rowe and others, to establish certain foods as etiologic in certain cases. He advises the trial diet, which need not be a balanced one for the short period but in thin patients should be up to calory requirements. If no new lesions appear, foods should be added one at a time until an exacerbation occurs, showing the adverse effect of the food last added. What disease of the face he treated, whether acne vulgaris with inconspicuous comedones, acne rosacea, or one of the other less common diseases somewhat resembling acne, he does not state. (White, C. J.: Acneform Eruptions of the Face, THE JOURNAL, Oct. 27, 1934, p. 1277.) This theory is an interesting one but requires confirmation. Certainly acne vulgaris is not the sort of skin disease that one would suspect of sensitization. The sebaceous glands are undoubtedly quite sensitive to minute amounts of iodide or bromide, and it may easily be possible that other substances have a like effect. This is not an allergic sensitization, however.

The effect of the sodium poor, vitamin rich diet of Gerson, Herrmannsdorfer and Sauerbruch has so decided an influence on tuberculosis of the skin that it has been tried in acne. Lerner reports good results in the pustular types of acne by the use of this diet, though it must be continued for several months before the cation relations of the body can be altered. (Lerner, Charles: Nutritional Treatment of Acne Vulgaris, *Arch. Dermat. & Syph.* **31**:527 [April] 1935).

The value of yeast in the treatment of acne vulgaris is supposedly due to its content of vitamin. The results as seen by dermatologists, however, have been disappointing. Few have been benefited and some have been made worse by the treatment, pustules increasing in number and size during the period of yeast therapy.

All the therapeutic results in acne vulgaris must be judged with a large portion of skepticism. The fluctuations of the disease are so unpredictable that it requires but little optimism to see improvement from many different procedures that may be mere coincidence.

The general treatment of acne consists in improving the general health in every possible way, relieving constipation if present, and regulating the hours of rest, of work and of play. The use of hot water and soap, even use of a scouring soap in the effort to loosen the tops of comedones, is advised. Ablution should be followed by the application of hot towels for ten or fifteen minutes, to be followed by a cold rub for a few minutes, drying, and application of a lotion. Sulfur lotions may be given, either solution of sulfurated lime diluted with ten parts of distilled water or lotio alba (sulfurated potash and zinc sulfate, of each 2 Gm. in rose water sufficient to make 60 cc.). Either of these is dabbed on the skin and allowed to dry. (Lotio alba should be shaken before use.) When these measures make the skin dry and scaly, they should be stopped until the dryness disappears.

It is good practice to open the pustules and gently squeeze out the contents. Comedones too may be squeezed out, if the squeezing can be done without injuring the skin. If the patient does this, directions for its proper performance and a warning against the use of undue force should be given.

Vaccines and toxoids may help to cut short a pustular exacerbation. Ultraviolet exposures or sun baths to the point of slight reaction with exfoliation give temporary emptying of pustules and some comedones. It is claimed that long continuance in such treatment results in cure, but most patients get discouraged before this happy termination is reached.

Roentgen rays in small doses, from 37 to 70 roentgens once a week to each area, give the best results in the deep type of acne. They should not be given if milder measures suffice, particularly in young persons. The limit of treatment for the average case is three full skin units (900 roentgens) on each area.

Every precaution must be taken to protect against overtreatment. The patient should be warned against accepting further roentgen treatment on changing physicians, unless the doctor proposing it is aware of the dosage already received.

GLANDULAR DEFICIENCY OR DEFICIENT UTILIZATION OF CALCIUM

To the Editor:—During the past two years I have seen a number of women who have many symptoms in common and whose therapy presents a great deal of difficulty. They are all between the ages of 20 and 35. Most of them have had children but some are unmarried. Their chief complaint has usually been extreme fatigue, and this has been associated with inability to regain weight after losses that range up to 20 or 25 pounds (9-11 Kg.), nervous instability and emotionalism, sensitivity to cold and some degree of menstrual irregularity. Many of these patients have had vague gastro-intestinal symptoms and some have had diarrhea as a result of colonic instability. Mental dulness is not present in any of these cases. As a matter of fact, most of these patients have been very keen mentally. Physical examination has usually revealed underweight, dryness of the skin and hair, and a tendency in a few to acne and definite hypotension. Tachycardia has been present in a few instances. Laboratory studies have occasionally revealed a moderate, secondary type of anemia, but the most striking feature has been the low metabolic rates, which have ranged from —15 to —25. In a few instances blood cholesterols were done and were usually elevated, but not always so. The blood sugar has tended to be low. These cases have seemed to be instances of mild pituitary cachexia. In many of them, thyroid extract has been tried and has usually failed to give more than very temporary relief and frequently has failed to cause any relief of symptoms or even to elevate the metabolic rate even when given in moderately large doses. I have used Armour's anterior pituitary extract at the rate of 1 cc. three times a week without appreciable change. I have also used other anterior pituitary extracts and I have been considering the use of the adrenal cortex substance made by the Wilson Company. It has seemed to me that the general anterior pituitary deficiency, particularly of the thyrotropic hormone, was the responsible factor and that, if I could find suitable replacement therapy, the problem of treatment would be much less difficult. I will appreciate your suggestions as to treatment of these cases with specific instructions as to amounts of pituitary hormones necessary if you feel that these are indicated, and also your opinion as to which of the commercial products now available are most suitable. Please omit name.

M.D., Pennsylvania.

ANSWER.—Many of the symptoms shown by these patients, such as extreme fatigue, loss of weight, nervous instability and emotionalism, sensitiveness to cold and severe menstrual irregularity, with keen mentality, occasional tachycardia and skin disturbances, may all be due to deficient calcium utilization. In fact, they are among the classic symptoms of a disturbed calcium balance. The remaining symptoms of low blood sugar and low blood pressure are occasionally seen in the vagotonic forms of calcium deficiency.

Without knowing the complete blood chemistry or the physical examination results, such as myotatic irritability, myo-edema or a Chvostek reaction, some difficulty of course arises in making a satisfactory diagnosis.

The best suggestion is that the cases be treated as subcalcium utilization types with the administration of calcium and vitamins for the vagotonic types and calcium with parathyroid gland for the sympathicotonic ones.

Parathyroid tablets are not demonstrably effective by mouth; parathyroid extract administered three times a week hypodermically in doses of from 0.3 to 0.6 cc. as beginning doses may be employed. These injections ought not to be given oftener than three weeks a month and should be discontinued as soon as the symptoms are relieved. On no account ought they be given over long periods as routine treatment.

USE OF TETANUS TOXOID IN ALLERGIC CHILD

To the Editor:—I have a 10 year old son who is one of the most highly allergic individuals that I have ever had the misfortune to know. He had diphtheria toxin-antitoxin when an infant and is also known by skin tests to be very sensitive to horse serum. His chief allergic manifestations are severe asthma, from which he is practically never entirely free, an allergic nose, a slight amount of eczema, and formerly severe gastro-intestinal cramps. Will you be kind enough to give me the best current information on the value of tetanus toxoid? The boy is no more apt to be a candidate for tetanus and gas immunization than any 10 year old youngster, but I shudder to think of being confronted with the necessity of giving him any kind of serum. Is there a gas bacillus toxoid? Under these circumstances would you advise the use of these toxoids? What is known of the duration and strength of the resulting immunity? Your advice and reference to literature, as well as the names of companies supplying such material, will be most appreciated. Please omit name.

M.D., California.

Answer.—Tetanus toxoid seems to be gaining in recognition as an effective, harmless preventive of tetanus. Investigation has shown that in animals and in man tetanus antitoxin is produced in response to immunization with toxoid. In France such immunization has reduced markedly tetanus in army horses, and centers have been established for immunization of workers exposed to tetanus infection. The introduction of immunization in the army is under consideration. According to Ramon (*Rev. d'immunol.* **1**:37 [Jan.] 1935) the best results are obtained by the usual three injections of toxoid followed by a further injection a month or more after the third injection or on the occasion of dangerous trauma. The immunity is believed to endure for several years. Reliable tetanus toxoid is available in this country but gas bacillus toxoid is not. At present practically nothing is known about immediate effects of tetanus toxoid or gas bacillus toxoid in children as sensitive as the boy mentioned in the question and consequently it may be safest to postpone immunizations as long as there is no grave or unusual danger of infection with tetanus or gas gangrene. Toxoids contain no serum.

LICHEN PLANUS

To the Editor:—Please outline the most widely accepted methods of treatment of lichen planus. Do sufferers from this condition have recurrences throughout life? Please omit name.

M.D., Ontario.

Answer.—There are many methods of treating this disease, which means that none of them are specific and sure. Any one of them may fail in any particular case. The disease occurs in two forms, the rare acute form and the ordinary chronic form.

The acute form should be soothed until its features of irritation subside. The patient should rest in bed if possible. Diet should be easily digestible and free from high flavoring, salt or smoked fish or meat, and alcohol. The urine should be examined early and at intervals. A few cases have been accompanied by glycosuria.

Soothing baths, such as the colloid alkaline bath, should be used. Three cupfuls of bran, oatmeal or starch are boiled in a gauze bag to make a porridge. A cupful of baking soda is stirred into a half tubful of water, the gauze bag of porridge is stirred and squeezed in the bath, and the temperature of the latter brought up to 37 C. before the patient gets in. If the water does not cover the patient completely, towels, kept wet and warm, should supplement it. The first bath should be of only ten or fifteen minutes' duration, but later ones may be longer if well received.

Instead of this, Jacquet's "douches sédatives" may be used, a spray under moderate pressure at a temperature of about 35 C. for from two to five minutes, then a short cold rinse. Alkaline diuretics are sometimes of value, given well diluted after meals.

Some authorities report striking improvement after lumbar or cisternal puncture and the withdrawal of from 10 to 15 cc. of fluid. Sun baths or mild ultraviolet rays have been helpful to some, always less than an erythema dose.

Roentgen rays given over the spine have been used by many dermatologists. One method of such treatment consists in drawing four areas 6 by 2 inches each side of the spine of the prone patient, leaving an untreated strip an inch wide along the spine. Hard rays, 180 kilovolts, are given at a distance of 50 cm. in a slanting direction through these areas so as to cross at about the depth of the spinal cord. A one-fourth inch copper filter is used and one-half erythema dose given to each field once in three weeks for three such exposures. (Andrews, G. C.: Diseases of the Skin, Philadelphia, W. B. Saunders Company, 1930, p. 465).

Ointments containing 1 per cent phenol and from 0.25 to 3 per cent menthol may be used for the itching. If widely used, the urine should be frequently examined to guard against phenol poisoning. Too extensive application of the menthol preparation should not be made for fear of chilling, particularly in sensitive or old patients. Menthol preparations should not be used near the eyes.

After subsidence of the acute symptoms, infectious foci should be cleared up, if possible.

For chronic cases, the general and local remedies already mentioned are often of value. Arsenic as solution of potassium arsenite, asiatic pills by mouth, sodium cacodylate subcutaneously, or mercury salicylarsenate either intramuscularly or intravenously, may be used. Arsenic is the chief remedy and often has to be used in large doses for a long time.

Bismuth compounds, given intramuscularly as for syphilis, has proved valuable in many cases. Yellow mercurous iodide or mercury with chalk by mouth, or the soluble or insoluble salts intramuscularly, is often of great value. The urine must be examined at regular intervals during the administration of any of these metals, and their use stopped on the appearance of albumin or casts.

The arsphenamines have not been of great value in the treatment of lichen planus.

High frequency currents or galvanic electricity, from 4 to 10 milliamperes, given frequently to the patches, are credited with clearing the eruption. Darier recommends high frequency or static baths. (Darier, J.: Text Book of Dermatology, translated and edited by S. Pollitzer, Philadelphia, Lea & Febiger, 1920, p. 136.)

Foreign protein therapy, injection of milk and vaccines are sometimes helpful. Stronger ointments of phenol, mercurials, tar and chrysarobin are used for local application to patches of lichen planus. It is well, as Pusey suggests, to begin with the milder strengths and increase them as needed. (Pusey, W. A.: Diseases of the Skin, New York, D. Appleton & Co., 1924, p. 456.)

The hyperkeratotic papules of hypertrophic lichen planus must first be softened by applications of sodium or potassium hydroxide or by salicylic plaster or salicylic collodion before treatment can be applied successfully.

	Gm. or Cc.
1. Phenol	0.3
Ammoniated mercury ointment	ad 30.0
2. Crude coal tar	2.0
Zinc oxide	2.0
Petrolatum	ad 30.0
(This may be made stronger as needed, or the undiluted crude coal painted on.)	
3. Chrysarobin	1.0
Salicylic acid	1.0
Petrolatum	ad 30.0

The chief rules of treatment are:

1. Soothe the acute cases.
2. Stimulate the chronic cases.
3. Persist.
4. Watch for signs of intolerance.

Recurrences of lichen planus are reported after long periods of freedom from the disease. More often, a few lesions remain for a long time and then there is a relapse. The disease persists for many years, one case of twenty years' duration being known. These, however, are exceptions to the rule that lichen planus clears under weeks or months of persistent treatment and does not recur.

INDICATIONS FOR FEVER THERAPY IN DEMENTIA PARALYTICA

To the Editor:—Is fever therapy contraindicated in the following case? A man, aged 33, since March 1936 has had a right hemiplegia with spasticity of the right upper and lower extremities. There is a mild impairment of memory for recent events as the only evidence of any mental involvement. The blood Wassermann and Kahn reactions are 4 plus; the spinal fluid Wassermann reaction is 4 plus in 1, 0.5 and 0.2 cc.; Ross Jones 1 plus, Pandy 2 plus. There are 9 cells and the colloidal gold curve gives a reading of 5555544320. Please omit name.

M.D., Illinois.

Answer.—If the laboratory reports of the spinal fluid examination are correct, it is evident that the patient is suffering from dementia paralytica. It is not certain, however, why the patient developed a right-sided hemiplegia. Not enough clinical data are available to allow one to judge whether this was due to a hemorrhage, to a thrombosis of the cerebral vessels or to some other factor. If the patient is to be treated with pyretotherapy it would be important to know whether his blood pressure is exceedingly high and whether the blood vessels in his brain are friable. If the case is one of thrombosis of some of the cerebral vessels, which occurred in March 1936, fever therapy would be advisable. If it is a cerebral hemorrhage due to hypertension and a syphilitic involvement of the cerebral blood vessels, fever would be contraindicated. All forms of

pyretotherapy have a tendency to increase the systolic and lower the diastolic blood pressure, thus increasing the pulse pressure. For this reason fever, even when produced by physical agents, has a tendency to put a greater load than usual on the entire cardiovascular system.

TREATMENT OF POMPHOLYX

To the Editor:—Would you please advise me as to the latest treatment of pompholyx.

R. W. BENZ, M.D., Honolulu, Hawaii.

ANSWER.—In order to approach the problem of therapy in pompholyx properly the various etiologic factors that might produce this condition must be given consideration. The conception of pompholyx and the dyshidrosiform dermatoses has been the subject of much discussion, and the grouping suggested by Wise and Wolf (*Arch. Dermat. & Syph.* **34**:1 [July] 1936) gives a broad conception of the possible etiologic factors that must be given consideration in treatment. They include:

1. Eruptions due to superficial mycotic infections—infections with Trichophyton, Epidermophyton and yeasts.
2. Eruptions of secondary nature resulting from primary fungous foci—epidermophytids, moniliids and trichophytids.
3. Eruptions caused by exogenous irritants. These fall in the category of dermatitis venenata, occupational dermatoses, trade eczemas, industrial dermatoses, dermatitis eczematosa and so forth. These eruptions are encountered most frequently among dyers, furriers, painters, tanners, leather-workers, barbers, hair-dressers, photographers, workers in ammunition and rubber factories, and in the electrical and oil industries, printers, typesetters, persons who handle food, florists, chemists, druggists, surgeons, dentists, nurses and persons in scores of other occupations and professions.
4. Vesicular eruptions of unknown cause—"eczema," dermatitis eczematosa and pompholyx.
5. Toxic eruptions caused by drugs, foods, etc.

The eruptions representing these groups are at times clinically indistinguishable from one another, and it is essential in the suggested therapy of pompholyx to rule out any of the known etiologic factors.

Pompholyx, per se, is included with the "vesicular eruptions of unknown cause." The local treatment of pompholyx consists of wet compresses of solution of aluminum subacetate, diluted with from 10 to 16 parts of water, or wet compresses of calamine lotion with phenol if itching is severe. Vesicles or bullae are punctured and drained. Fractional x-ray exposures, from 75 to 88 roentgens weekly, to the affected sites are of value. In the dry, scaling stage, the use of 3 per cent ichthammol ointment or 3 per cent salicylic acid and 3 per cent sulfur precipitate in petrolatum is of value. General tonic treatment with the use of arsenic and hematinics is sometimes indicated.

The removal of any etiologic factors mentioned in the outline, and their special treatment, are essential for success in therapy.

PERIODIC INTERMENSTRUAL PAIN

To the Editor:—I should like some information for the treatment of a woman, aged 39, who for a number of years has had periodic pain occurring in the midpelvic region. A number of years ago she had her appendix removed for a similar type of pain. During the past year I have been able to associate this pain definitely with ovulation, as it invariably occurs from thirteen to fourteen days before menstruation, which is irregular, and lasts from an hour to two to several days, and at no time has there been a recurrence until the next midmenstrual period. What can be done in the way of treatment? At times the pain has been severe enough to require morphine. Would an artificial menopause by the use of high voltage x-rays be indicated?

J. R. JARVIS, M.D., Ohio.

ANSWER.—The case is apparently a typical instance of periodic intermenstrual pain, or "mittelschmerz," which has long been looked on as related in some way to ovulation, though the exact mechanism is still unknown. The pain may be of mild degree but in some cases is so intense that it has led to the mistaken diagnosis of some acute abdominal disease, such as acute appendicitis or tubal pregnancy.

In the milder forms of ovulation pain no treatment may be necessary or, at most, some simple analgesic, such as codeine or some other suitable product, together with rest and the local use of heat. For the more severe forms, surgical intervention has often been resorted to, either designedly or under the mistaken diagnosis of some other pelvic condition. Removal of the ovary on the affected side has apparently been the most frequently successful procedure, though the pain may at times recur on the opposite side. In the case described by the correspondent the patient is nearing the menopausal age, and, if the symptoms are sufficiently severe, if they are not relievable by simple measures, and if the question of further reproductiveness is not of importance in this patient, the x-ray induction of the artificial menopause would be justified and should relieve the condition. For a recent article on this general subject the correspondent may be referred to the paper of Wharton and Henriksen, published in THE JOURNAL, Oct. 31, 1936.

TOXICITY OF SPRAY PAINTING

To the Editor:—In the past month I have had two employees of the furniture company who operate spray varnish machines and who blame the occupation for their complaints. They work under a hood with an exhaust fan but state that it is inefficient and that the varnish has a naphtha base, which is the ingredient that they claim caused the difficulty. The first one had symptoms simulating peptic ulcer and stated that if he stayed away from the vapor he was all right. He refused to have x-ray and gastric analysis done. There was no diarrhea, and physical examination revealed nothing. The second man had a sore throat, which was the ordinary follicular tonsillitis, and I am positive that the fumes had nothing to do with the infection. It cleared without difficulty or sequelae. I have looked through my available literature without finding anything that would lead me to believe that the occupation has anything to do with either case; but I can easily believe that the constant inhalation of such fumes might lead to gastro-intestinal difficulties. Am I correct and what are the symptoms and signs of such intoxication and what systems are most affected? Where might I find additional references to such industrial hazards? Please omit name.

M.D., Pennsylvania.

ANSWER.—All organic solvents are more or less toxic and somewhat anesthetic. Those which have a naphtha base may be less harmful than some of the others, but it is rash to generalize on the subject. Men doing such spraying should be equipped preferably with masks supplied with fresh air under slight pressure. A list of firms supplying such equipment can be had from the United States Bureau of Mines, Pittsburgh.

The toxicology of most of the organic solvents commonly used in paints and varnishes is given under their chemical names in Flury, Ferdinand, and Zangger, Heinrich: Lehrbuch der Toxicologie für Studium und Praxis, Berlin, Julius Springer, 1928. See also "Poisoning by Petroleum Distillates" by E. R. Hayhurst, which appeared in *Industrial Medicine*, vol. 5, February 1936.

BRONCHIAL ASTHMA

To the Editor:—In the past two months I have had an unusually large number of patients with bronchial asthma. They have eosinophilia. They have negative skin tests with ragweed. Their attacks occur between September and the end of November. Am I justified in giving these patients a series of ragweed pollen injections? Is it usual that asthma cases do not show the offending agent by the skin test? Please omit name.

M.D., New York.

ANSWER.—This inquiry does not give sufficient data for more than a general answer. No mention is made of symptoms of hay fever preceding the attacks of asthma from September to November. Patients with asthma due to ragweed pollen give a typical history of symptoms of hay fever coming on in mid-August (in the region noted). The attack of asthma usually starts near the end of August and in cases of long standing may persist for a month to several months after the end of pollination. The attacks of asthma may not be preceded by hay fever in some cases of long standing. Occasionally also a patient may develop pollen asthma with no previous history of ever having had hay fever. Skin reactions are present in such a large proportion of pollen sensitive patients that their absence in known pollen sensitive patients has been considered worth recording:

Kern, R. A.: Seasonal (Pollen) Hay Fever with Negative Skin Tests, *Ann. Clin. Med.* **5**:371, 1926.

Kahn, I. S.: Significance of Negative Skin Tests in Pollen Hay Fever and Asthma in Infants and Young Children, *South. M. J.* **21**:539 (July) 1928.

Wilmer, H. B.: Diagnosis and Treatment of the Atypical Types of Hay Fever, *J. Allergy* **1**:87 (Nov.) 1929.

In the presence of a history of seasonal asthma suggestive of pollinosis, the scratch test, if negative, should be followed by intradermal tests with the suspected pollen, a 1:10,000, a 1:1,000 and, if necessary, a 1:100 pollen solution being used for such tests. If these tests are still negative, a conjunctival test (placing the pollen grains on the inside of the lower eyelid) or an intranasal test by insufflation of pollen should be done. If such study still produces negative results, other tests, especially for molds (with special reference to Alternaria and Aspergillus), should be done. Mold-sensitive patients give a history very similar to the history of those who are pollen sensitive. If all these studies have failed to explain the patients' symptoms, one may then, in patients giving a characteristic history, try the use of ragweeds. As previously mentioned, the percentage of such cases is small.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, May 29, page 1912.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* June 21-23 and Sept. 13-15. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOGY: *Oral examinations for Group A and B applicants* will be held in Philadelphia, June 7-8. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Practical* examination will be given at Philadelphia in June. *Written examination* will be held in different centers of the United States and Canada in October. Chairman, Dr. Walter L. Bierring, 406 Sixth Ave., Rm. 1210, Des Moines.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Practical, oral and clinical examinations for Group A and B applicants* will be held at Atlantic City, N. J., June 7-8. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: Philadelphia, June 7 and Chicago, Oct. 9. *All applications and case reports, in duplicate, must be filed at least sixty days before the date of examination.* Sec., Dr. John Green, 37.20 Washington Blvd., St. Louis, Mo.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Atlantic City, N. J., June 8. Sec., Dr. Fremont A. Chandler, 6 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: Philadelphia, June 7-8. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PATHOLOGY: Philadelphia, June 7-8. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit, Mich.

AMERICAN BOARD OF PEDIATRICS: Atlantic City, N. J., June 6. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Illinois.

AMERICAN BOARD OF SURGERY: *Part I (written),* Sept. 20. Sec., Dr. J. Stewart Rodman, 225 S. 15th St., Philadelphia.

AMERICAN BOARD OF UROLOGY: *Oral examination.* Minneapolis, June 25-26. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

West Virginia March Report

Dr. Arthur E. McClue, secretary, West Virginia Public Health Council, reports the oral and written examination held at Charleston, March 1-3, 1937. The examination covered 11 subjects and included 110 questions. An average of 80 per cent was required to pass. Fifteen candidates were examined, all of whom passed. Twelve physicians were licensed by reciprocity and 3 physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Arkansas School of Medicine		(1935)	89.5
Northwestern University Medical School		(1937)	88.8
Rush Medical College		(1936)	87.6, 89, 90.2, 90.6
School of Medicine of the Division of the Biological Sciences		(1931)	89.7
Louisiana State University Medical Center		(1936)	90.2
University of Michigan Medical School		(1934)	85.1
Cornell University Medical College		(1933)	84
Duke University School of Medicine		(1932)	87.2, (1935) 84.9, 88.8
University of Cincinnati College of Medicine		(1935)	88.9*
Western Reserve University School of Medicine		(1935)	91

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Georgia Medical Department		(1928)	Georgia
Rush Medical College		(1936)	Michigan
University of Louisville School of Medicine		(1927), (1933)	Kentucky
Louisiana State University Medical Center		(1934)	Louisiana
University of Michigan Medical School		(1935)	Penna.
Duke University School of Medicine		(1932, 2)	N. Carolina
Western Reserve University School of Medicine		(1933)	Ohio
Meharry Medical College		(1931)	Tennessee
Medical College of Virginia		(1931), (1933)	Virginia

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Rush Medical College		(1930)	N. B. M. Ex.
University of Maryland School of Medicine and College of Physicians and Surgeons		(1933)	N. B. M. Ex.
Woman's Medical College of Pennsylvania		(1931)	N. B. M. Ex.

* This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship.

Kentucky Reciprocity Report

Dr. A. T. McCormack, secretary, State Board of Health of Kentucky, reports 15 physicians licensed by reciprocity from Jan. 6 through April 4, 1937. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Emory University School of Medicine		(1934)	Mississippi
Northwestern University Medical School		(1936)	Illinois
University of Louisville School of Medicine		(1934)	New Jersey
University of Minnesota Medical School		(1933)	Minnesota
Ensworth Medical College, Missouri		(1912)	Nebraska
Washington University School of Medicine		(1933)	Missouri
Eclectic Medical College, Cincinnati		(1914), (1936)	Ohio
Temple University School of Medicine		(1932)	Penna.
Tennessee Medical College		(1905)	Tennessee
University of Tennessee College of Medicine		(1934)	Tennessee
Vanderbilt University School of Medicine		(1929) (1934)	Arizona, Tennessee
Medical College of Virginia		(1934)	Virginia
University of Virginia Department of Medicine		(1933)	Virginia

Montana April Report

Dr. S. A. Cooney, secretary, Montana State Board of Medical Examiners, reports the written examination held in Helena, April 6-7, 1937. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Four candidates were examined, 3 of whom passed and one failed. Six physicians were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Rush Medical College		(1930)	88.1
Vanderbilt University School of Medicine		(1933)	79.8
University of Alberta Faculty of Medicine		(1936)	81.9

School	FAILED	Year Grad.	Per Cent
University of Edinburgh Faculty of Medicine		(1926)	57.1

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University Medical School		(1934)	Wyoming, (1936) Oklahoma
University of Minnesota Medical School		(1927)	Minnesota
Creighton University School of Medicine		(1921), (1932)	Nebraska
University of Pennsylvania School of Medicine		(1927)	N. Carolina

Maine March Examination

Dr. Adam P. Leighton, secretary, State of Maine Board of Registration of Medicine, reports the written examination held in Portland, March 9-10, 1937. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Seventeen candidates were examined, all of whom passed. Two physicians were licensed by reciprocity and 2 physicians were licensed by endorsement after an oral examination. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
George Washington University School of Medicine		(1935)	80
Rush Medical College		(1936)	81
Boston University School of Medicine		(1934) 84, (1936)	85
Harvard University Medical School		(1935) 82, 84, 87, (1936)	84
Tufts College Medical School		(1935) 82, 87, (1936) 84,	84, 85
Hahnemann Medical College and Hosp. of Philadelphia		(1936)	88
McGill University Faculty of Medicine		(1936)	82
National University of Athens School of Medicine		(1934)	77*
Regia Università degli Studi di Roma, Facoltà di Medicina e Chirurgia		(1934)	80

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Jefferson Medical College of Philadelphia		(1934)	Penna.
University of Vermont College of Medicine		(1924)	Vermont

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Yale University School of Medicine		(1934)	N. B. M. Ex.
Johns Hopkins University School of Medicine		(1932)	N. B. M. Ex.

* Verification of graduation in process.

Rhode Island January Examination

Mr. Robert D. Wholey, chief, Division of Examiners, reports the oral, written and practical examination held by the Board of Examiners in Medicine at Providence, Jan. 7-8, 1937. The examination covered 20 subjects and included 50 questions. An average of 80 per cent was required to pass. Ten candidates were examined, 7 of whom passed and 3 failed. Two physicians were licensed by endorsement after an oral examination. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Harvard University Medical School		(1934)	81
Cornell University Medical College		(1917) 80, (1935)	85
Syracuse University College of Medicine		(1929)	84
New York University, University and Bellevue Hospital Medical College		(1933)	81
Hahnemann Medical College and Hosp. of Philadelphia		(1935)	85
Jefferson Medical College of Philadelphia		(1935)	81

School	FAILED	Year Grad.	Per Cent
Georgetown University School of Medicine		(1934) 52, (1935)	63
Tufts College Medical School		(1932)	62

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Boston University School of Medicine		(1934)	N. B. M. Ex.
University of Rochester School of Medicine		(1934)	N. B. M. Ex.

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Book Notices

A Textbook of Medicine. By Charles Phillips Emerson, M.D., Research Professor of Medicine, Indiana University. Cloth. Price, $8. Pp. 1,296. Philadelphia, London & Montreal: J. B. Lippincott Company, 1936.

The purposes of this new textbook are outlined in the preface by the author. The aim is to present internal medicine in terms of the clinical pictures of diseases, explaining these by the fundamental facts of pathology, biochemistry and other fields. The symptoms, therefore, are related so far as possible to disturbances of fundamental nature. The author believes that the history of some diseases is important in understanding them as well as being matters of interest, and hence he includes several short biographies of men important to medical progress. Each disease syndrome is presented as a defense mechanism. It is either the result of a struggle between the patient's body and invading germs or the expression of an attempt of the various organs to function efficiently in spite of lesions or dysfunctions. This task is quite unenviable. Nevertheless the degree of success obtained is noteworthy. Naturally it was impossible to discuss any of the diseases or disorders completely. The relative space assigned to each subject, however, is exceptionally well chosen. Classification of the diseases naturally is difficult and in this instance has resulted in some faults of arrangement which should be remedied in subsequent editions. Thus food infections are considered under both specific infectious diseases and diseases due to drugs and poisons. Lobar pneumonia is placed under specific infectious diseases, while acute pleurisy is placed with diseases of the organs of respiration. Omissions are remarkably few. Little controversial material is found, although some workers in the field would differ with the author's statement in his section on gout that "the determination of the uric acid of the blood and urine aids but little in this diagnosis, since both may lie within normal limits." One may safely say that this textbook is as satisfactory as it is possible for any one man to achieve today. The index is exceptionally good and evidently has received a great deal of attention, as can be judged by its eighty-five page length.

An Introduction to Comparative Biochemistry. By Ernest Baldwin, B.A., Ph.D., University Demonstrator in Biochemistry, Cambridge. With a foreword by Sir Frederick Gowland Hopkins, F.R.S. Cloth. Price, $1.50. Pp. 112, with 11 illustrations. New York: Macmillan Company; Cambridge: University Press, 1937.

Baldwin has written the first textbook on the evolution of animals from a chemical point of view. It is a lucid work. Perhaps the part of most interest to physiologists and physicians is that on water balance and kidney action. By tracing the entire evolution of the kidneys, the subject is a great deal more intelligible than it would be if taken up merely from the standpoint of the mammalian kidney. The simplest kidney action is merely the pumping out from the body of water containing waste products, and this water is then replaced by osmosis. The first difficulty arises in adaptation to fresh water in which there is not enough salt in the incoming water, and work has to be performed by the kidney in pumping out a hypotonic urine. After the filtrate of the blood passes out of the glomerulus or a similar organ, a salt-absorbing segment is added. The adaptation to a dry condition has led to the abolition of the glomerulus in marine bony fish, snakes and lizards and to the development of the loop of Henle in birds and mammals. The passage of embryonic and larval stages inside an egg shell or uterus is an adaptation to fresh water and land conditions for the preservation of the salts. Protein metabolism is affected by a scarcity of water, aquatic animals starting out with ammonia as a form of excretory nitrogen, requiring a great deal of water for its dilution to diminish its toxicity. The development of urea is to detoxify ammonia, but this also requires some water for its excretion. Uric acid can be excreted in the solid form and thus conserve water. Baldwin accepts the arginase theory of urea formation and concludes that uric acid arises only from other purines and not from urea. On the other hand, uric acid may be broken down into urea through the intermediate stage of allantoin. He states that smooth, striated and heart muscle of all animals contains phosphagen, although this is phosphocreatine in the higher animals and phospho-arginine in the lower animals. Hemoglobin and other respiratory pigments are considered adaptations to lack of oxygen, the wide distribution of hemoglobin being due to its having the same prosthetic group as cytochrome, which is universally present. Hemocyanin, on account of having a lower loading tension for oxygen, is advantageous to animals in passing from water to a land habitat; but, once that habitat is established, hemoglobin is the more efficient. He notices that the blood pigment is kept in the blood vessels by high molecular weight or confinement in the corpuscles, that dissolved in the plasma having molecular weights of about 2,000,000. He considers cytochrome and the yellow respiratory enzyme of Warburg, the latter not requiring a cyanide sensitive oxidase for its action. He mentions the fact that methylene blue as a carrier of oxygen increases the rate of respiration. So does the natural bacterial pigment pyocyanin, and also hallachrome and echinochrome. The theory of Raper of melanin formation is accepted and hallachrome, a red pigment of worms, is considered an intermediate. The book seems remarkably free from errors, the only one noted being that the salt content of the Great Salt Lake is given as 10,000 times too small. Perhaps the best section of the book is the foreword by Sir F. Gowland Hopkins, in which he says "I venture to think that productive thought in biochemistry in particular calls for the widest possible survey of life's manifestations." Some of the pioneers in medicine have been leaders in botanic investigations also, and even today a wide range of interest is conducive to contributions to knowledge.

Festschrift zum 60. Geburstag von Hofrat Prof. Dr. Hans Molisch. [Sonderband zu Mikrochemie Band XXI.] Paper. Price, 28 marks. Pp. 454, with 82 illustrations. Vienna & Leipzig: Emil Haim & Co., 1936.

As a special mark of esteem on his eightieth birthday, friends and pupils of Professor Molisch joined in honoring the Nestor of applied microchemistry by dedicating to him the results of some of their work, which was inspired by his teaching. Emil Haim, the publisher, founder and ever ready financial sponsor of *Microchemie*, and the editors, A. A. Benedetti-Pichler, Emich, Friedrich, the late Pregl, Lieb, Lindner, Kofler and Niederl, are to be thanked for their effort in issuing anniversary volumes at intervals in honor of the distinguished pioneers of microchemistry. Microchemistry is Austria's distinct contribution to chemistry. Without it, modern research in biologic chemistry and experimental medicine could not have progressed so rapidly. The journal *Microchemie* is indispensable to every biochemical worker, as it contains the minute details of procedures in microchemical investigations. It is impossible in this brief review to give due credit individually to each scholarly contribution in the Molisch festschrift. However, the article by A. A. Benedetti-Pichler and W. F. Spikes on "Studies in Qualitative Separations on a Micro-Scale" deserves special emphasis, as the authors describe a procedure long needed for basic qualitative micro-analysis. It is hoped that in the future America may make its contribution, perhaps, by erecting a microchemistry institute that may serve as a center for Americans who are unable to study abroad. Possibly some of the pupils of these illustrious teachers—Emich, Donau, Lieb, Pregl and Feigl—might carry on their work here. May Professor Molisch live to see this day and, together with Emich, dedicate such an institution for the benefit of humanity.

The Pharmaceutical Recipe Book (R. B. 11). By Authority of the American Pharmaceutical Association. Prepared by the Committees on Recipe Book and on Unofficial Formulas of the American Pharmaceutical Association. Second edition. Cloth. Pp. 529. Washington, D. C.: American Pharmaceutical Association, 1936.

As stated in the preface, the Recipe Book represents the outcome of an effort of the American Pharmaceutical Association to place in the hands of the practicing pharmacist a reliable and comprehensive book of recipes applicable to his business. The volume is divided into several parts relative to different types of formulas: part 1, pharmaceutical; 2, flavoring extracts; 3, dental; 4, chiropodologic; 5, veterinary; 6, photographic; 7, cosmetic; 8, technical and miscellaneous; 9, laboratory reagents; 10, schedule of antidotes for poisons; 11, average doses of

unofficial drugs, and 12, table of solubilities. The type and typography of the book resemble the U. S. Pharmacopeia XI and the National Formulary VI, somewhat tending to lend an official air. There are nearly 2,000 formulas covering the unofficial ones commonly used in the drug store, the hospital and the laboratory; also many that are frequently used about the boudoir, the household and the workshop. As far as the value of the volume to the physician is concerned, it is more serviceable in indicating relics of the past than present day progress. The book is an advancement over the usual formulary describing polypharmaceutic mixtures or imitations—"patent medicines"—heretofore exploited by certain publishers. The volume is to be commended, however, in that it does not advance any claims for remedial action or assume any responsibility for the therapeutic values of any of the formulas or specify dosage.

Applied Physiology. By Samson Wright, M.D., F.R.C.P., John Astor Professor of Physiology, University of London, Middlesex Hospital Medical School. Sixth edition. Cloth. Price, $6. Pp. 686, with 282 illustrations. New York & London: Oxford University Press, 1936.

A record of six editions in ten years would seem to indicate that this book has found a most useful place in its field. The present edition provides new considerations, particularly in relationship to cerebral localization, reflexes, speech, metabolism and the glands. The author expresses his special appreciation to the series on glandular physiology and therapy published in THE JOURNAL. He has, moreover, added extensively to the methods and technics that are described in the work as these have been brought out in current periodical literature. Attention is called to nineteen new illustrations and to the redrawing of many of the older illustrations in order to make them more illustrative. The author has also borrowed freely from well established textbooks in related fields to improve the quality of his excellent work. In his table of contents he indicates in italic those sections of the work which are particularly of clinical interest, thus enabling the practitioner who wishes to bring himself down to date to read readily those portions of the work which concern him. More and more the practice of internal medicine and of surgery is coming to ground itself in physiology. The title of this book indicates its practical service as a liaison volume between the basic sciences and the practice of medicine. Its numerous prompt revisions indicate its timeliness and its dependability.

Clinical Laboratory Diagnosis. By Samuel A. Levinson, M.S., M.D., Director of Laboratories, Research and Educational Hospitals, Chicago, and Robert P. MacFate, Ch.E., M.S., Assistant Director of Laboratories, Research and Educational Hospitals, Chicago. Cloth. Price, $9.50. Pp. 877, with 157 illustrations. Philadelphia: Lea & Febiger, 1937.

As time moves on, the teachers of a previous period and the textbooks which represented their technics of pedagogy are replaced by a new generation and a new series of volumes. It is occasionally possible for a modern reviser to build on the foundations of the past. Levinson and MacFate have, however, chosen to present an entirely new work based on the outlines which they distribute to their own students at the University of Illinois College of Medicine. They have thought it wise to include enough data in the fundamental fields of anatomy, physiology, biochemistry and clinical medicine to provide the student with a rational approach to laboratory technic. In most instances they supply the approved technic without attempting to list all of the various methods that are available. For their hematology they are indebted largely to Dr. Jaffé of the Cook County Hospital, and for their pediatric procedures to Dr. H. G. Poncher. Likewise their section on legal medicine and toxicology is an outgrowth of the work carried on by the coroner's toxicologist, Muehlberger. The volume is systematically arranged, considering first the tests involved in the gastrointestinal tract from the mouth to the rectum. It follows with metabolism, blood and urine, hematology, immunology, spinal fluid bacteriology, skin tests and then the special topics that have been mentioned. The book is beautifully printed, its outlined character fully apparent by the nature of the headings that are used on individual chapters, paragraphs and similar subdivisions. The illustrations are profuse and chosen obviously with a desire to be of the greatest possible helpfulness. There are a considerable number of plates, some of them in color. An efficient index forty pages in length concludes the work. It may be unqualifiedly recommended to physicians and students as a succinct, authoritative and useful laboratory guide.

Om Amylasen i Blod og Urin: Dens Udskillelse gennem Nyren. Af Gregers Nørby. Paper. Pp. 148, with 29 illustrations. Copenhagen: Levin & Munksgaard, 1935.

The author gives a discussion of the methods for determination of amylase, their application to blood and urine and the errors involved. In determining the amylase of the blood, the author found that it was all contained in the plasma, none being present in the corpuscles. Although the amylase of the plasma was rather constant from day to day in the individual case, rather wide differences were found between different individuals. The stability of amylase in the urine was studied and it was found that at temperatures under 40 C. and at a P_H from 5.0 to 9.0 the specimens retained their amylase content rather well. The excretion of amylase in the urine was found to be proportional to the concentration in the serum. The author also studied the excretion of creatinine, using a Pulfrich "stufenfotometer" for its determination. The excretion per unit of time was found to be a linear function of the concentration of creatinine in the serum. The excretion of amylase and of creatinine seemed to be independent of each other. Because of the exhaustive discussion of methods for the determination of amylase and of creatinine, this monograph should prove of value to all interested in the subject.

Relief and Health Problems of a Selected Group of Non-Family Men. By Glenn H. Johnson, Research Assistant, School of Social Service Administration, University of Chicago. University of Chicago Social Service Monographs. Paper. Price, 50 cents. Pp. 81, with illustrations. Chicago: University of Chicago Press, 1937.

One hundred and forty-four men whose only identifying factor common to all is that they are not living with families of their own are studied. Half of them had lived in Cook County for twenty-six years or more, while only eight had less than ten years' residence. Only twenty of these men had been known to any case work agency, so that they were in general a self-supporting group until economic conditions or some temporary or chronic illness brought them to a relief office. The conditions of housing were extremely poor, only sixty-three having sleeping quarters that could be characterized as good. Yet there was a tendency to cling tenaciously to a freedom of choice of those things which are personal and intimate. Only fourteen were without some physical or mental health complaint. Special housing provisions and convalescent homes are needed for the care of this class. Although a majority were poorly educated, there were ten high school and four college graduates; seventy-five were rated as employable. The report recommends the abolition of "shelters" and characterizes the "family responsibility" requirements of the Illinois Pauper Law as a retrogressive public policy. Invalidity pensions are also recommended. Existing relief programs are declared to be inadequate to meet the needs of this class.

Einführung in die pathologische Physiologie. Von Professor Dr. Max Bürger, Direktor der medizinischen Universitäts-Poliklinik, Bonn a. Rh. Second edition of "Die pathologisch-physiologische Propädeutik." Paper. Price, 24 marks. Pp. 454, with 43 illustrations. Berlin: Julius Springer, 1936.

This distinctive and carefully written book covers the general field of abnormal or applied physiology and is therefore of special interest to third and fourth year medical students. In addition, however, it should interest all those who are endeavoring to improve the practice of medicine in the matter of accurate diagnosis and rational treatment. It is written by a clinician who for years has lectured to students on this subject and who draws on an extraordinary repertory of physiologic and biochemical information. In his introduction Bürger points out the fallacies of the old "organ diagnosis" in internal medicine and emphasizes the interdependence of the various parts of the body. While this idea is gaining ground in medicine, its implications still require emphasis, and the book abounds in excellent illustrations of it (e. g., psoriasis, p. 320). More discrimination is needed in the ordering of such things as "strict bed rest" and "hot dressings." This book deserves careful reading and a translation into English.

The Social Workers' Dictionary. General Editors: Erle Fiske Young, Ph.D., and Bessie Averne McClenahan, Ph.D., The School of Social Work, The University of Southern California. Editor for Social-Legal Terms: Pauline V. Young, Ph.D., The School of Government, The University of Southern California. Paper. Price, 75 cents. Pp. 71. Los Angeles: Social Work Technique, 1936.

This pamphlet indicates the manner in which the field of social service has gradually developed not only a new profession but also a new language for that profession. The social service worker must obviously be acquainted not only with the language of medicine and of the hospital but also with the terms used by patients in discussing their illnesses, their manner of living and their ability to pay. The authors of this book have carefully compiled most of the difficult terms that are likely to arise in such discussions and their definitions are exceedingly apt. The book is hardly one that will be useful for the physician but no doubt the rapid growth of social service, including the incorporation into the midst of this profession of some 200,000 amateurs, indicates the need for such a book.

Lysozyme. Typhoid Fever. Diphtheria. Rheumatism. Ukrainian Metchnikoff Institute, Symposium of the Institute's Works. Paper. Price, $1. Pp. 322, with illustrations. Kharkov: The Institute, 1936.

This book deals with the results of investigations at the Metchnikoff Institute of Kharkov under the direction of M. Melnik. There are four main topics: lysozyme, the stable substance discovered by Fleming in 1922 in various products and tissues of the animal body, which in neutral or slightly alkaline medium dissolves various bacteria, saprophytic as well as pathogenic; single immunization against typhoid by injecting vaccine and culture filtrate of typhoid bacilli with alum, thus producing an antigenic depot; single immunization against diphtheria with alum precipitated toxid; streptococcic allergy and rheumatism. The parts dealing with lysozyme and antidiphtheria immunization are in English, the two other parts in French. The book is well printed on substantial paper. Its contents will interest those who are concerned with the topics discussed.

Wide Is the Gate. By Loyd Thompson. Cloth. Price, $2. Pp. 320. New York: Macaulay Company, 1937.

Here in a fictional form is an accumulation of information concerning the methods of charlatanism, particularly as practiced in the United States, from the least of these to John R. Brinkley. Informed readers will recognize in many of the descriptions the actual record of Brinkley himself. While the author lacks the sure fictional touch of the experienced story writer, his volume includes sufficient drama to sustain the factual data that are incorporated in the story. It may be doubtful that the general reader will find the book as fascinating as will the medical reader, but either will derive from it much that is informative and at least a considerable amount of material that is interesting.

Vocational Guidance Throughout the World: A Comparative Survey. By Franklin J. Keller, Principal, Metropolitan Vocational High School, New York City, and Morris S. Viteles, Associate Professor of Psychology, University of Pennsylvania. Cloth. Price, $4. Pp. 575, with illustrations. New York: W. W. Norton & Company, Inc., 1937.

Vocational guidance has become in recent years a subject of general as well as professional study. The book under consideration, which is principally a comparative survey of vocational guidance throughout the world, can be read with profit by those lacking in technical training in the field as well as by those professionally concerned. Vocational guidance in other countries is discussed against the background of existing conditions in the United States. Each country is introduced with a brief description of that social, political and economic background which is essential in understanding the formulation of vocational guidance policies and methods. These introductions are moderate in tone and sympathetic in point of view. It is refreshing to find that this holds true for fascist, communist and democratic countries alike. Much is thus added to the understanding of the ensuing material. Two chapters, on psychologic methods in vocational guidance and psychologic methods for the analysis of the individual, are placed in the middle of the book between the discussion of Switzerland and that of Italy. The reason for inserting these chapters in this portion of the book seems somewhat obscure. An appendix containing samples of general record forms, questionnaires, certain psychologic tests, medical contraindications and miscellaneous material is included. The book is so written that it will serve to interest the layman with only a casual knowledge of the field as well as those more professionally involved, for whom it would seem to be indispensable.

Meditsinskaya literatura USSR: Sistematicheskiy ukazatel knig i zhurnalnykh statey 1933. God izdaniya tretiy. [Medical Literature of Russia: Systematic Index of Books and Articles for 1933. Third Year of Issue.] Cloth. Price, 20 rubles, 6 kopecks. Pp. 294. Moscow & Leningrad: Gosudarstvennoe izdatelstvo biologicheskov i meditsinskoy literatury, 1936.

The present volume is an index of biologic and medical literature published in the Soviet Union for the year 1933. The Bureau of the All-Union Institute of Experimental Medicine for publishing medical bibliography has decided to utilize bibliographic material collected by Dr. A. E. Molotkov and covering the Russian medical literature from the sixteenth century to 1929. The plan is much like that of the *Index Medicus*, with its general subdivisions, an index of the authors and subject index, with the difference, however, that a brief subject content is appended to each reference. The text is in Russian only, making the material largely inaccessible except to those familiar with the language.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Fracture of Hip; Migration of Bone Peg Into Bladder.—In October 1933 the plaintiff sustained an intracapsular fracture of her left femur, and the defendant, an orthopedic surgeon, performed an operation to reduce the fracture, inserting a bone peg about 5 inches long and approximately five-sixteenths of an inch in circumference to hold the fragments in apposition. An infection later developed in the hip, and drainage was instituted. Shortly thereafter, the plaintiff's abdomen became distended and she suffered intense pain. The distention disappeared under the family physician's treatment in a few weeks. At various times during the next three or four months the plaintiff experienced "bleeding of the bladder" and suffered from frequent and painful urination. Urinalysis showed the urine to be alkaline and to contain blood and pus. During this time the defendant continued to treat only the fracture, but at the time of each visit he also examined the plaintiff's abdomen and observed her general condition. As to the abdominal condition, he acted only in an advisory capacity, leaving the treatment of that condition to the family physician. Finally, in April 1934 a urologist was called who caused roentgenograms to be made, disclosing that the bone peg had migrated into the bladder. According to the record, the peg was lodged completely within the bladder and its point of entry had become walled off by proliferative tissue.[1] Following an operation to remove the peg a complete recovery ensued. The patient then sued the defendant and from a directed verdict for the defendant she appealed to the Court of Appeals of Kentucky.

The plaintiff, while admitting that the fortuitous lodging of the bone peg in the bladder was not due to any fault of the defendant, claimed that he was negligent in failing to discover sooner that the peg had migrated. There was medical testimony to the effect that, even if the migration of the peg had been detected earlier, it would have been inadvisable to remove it until it had become free of the femur or, if it had entered the bladder, until it had become walled off in order to prevent extravasation of urine and the setting up of a lethal sepsis. The defendant, called as a witness by the plaintiff, testified that any examination of the patient, other than the type he made, would have been to her detriment rather than to her benefit, that it was inadvisable to disturb the patient on

1. Grant, Owsley: An Unusual Foreign Body (Bone Peg) in the Bladder, J. A. M. A. **107**:1632 (Nov. 14) 1936.

account of the condition of her hip and because of her excitability. He further testified that although he discovered in January 1934 that the peg was no longer in the bone, he was justified in presuming that the migration would be outward, not inward, because, as he testified, "there is no case on record where any ever worked in." He would not have been justified, he said, in moving the patient, jeopardizing the union that had already taken place, in order to take a roentgenogram to discover something that had never been known to happen before.

The location of the peg in the tissues, said the Court of Appeals, before it entered the bladder as well as after it completed its tour, could have been detected by a roentgen examination. The fractured hip and its cure were, however, of first importance. As long as the abdominal condition was not obviously impairing the plaintiff's health or life, it was the defendant's duty to allow the family physician's treatment thereof to be continued until a roentgen examination could have been made and an operation performed to relieve the abdominal condition without interfering with the healing of the fracture. At the time when the peg was in the femur or was passing into the bladder, and not entirely within it, an operation to remove it was not only inadvisable but perilous to the patient's fractured hip and to her health and life. If the defendant, therefore, by a roentgen examination or otherwise, had sooner located the peg, such discovery would not have justified its removal nor would such examination have alleviated the pains suffered by the patient. The fact that a sedative had never been needed to relieve the patient's pain tended to establish, the court thought, the soundness of the defendant's judgment not to sacrifice the treatment and cure of the fractured hip in order sooner to discover the cause of those pains.

Negligence on the part of a physician cannot be presumed from evidence merely of pain and suffering, of failure to effect a cure or to obtain the result expected by the patient, of poor or bad results, of bad judgment, or of the presence of infection. The doctrine of res ipsa loquitur has no application. The physical appearance of a patient following a physician's treatment and the patient's declarations with respect to the existence or severity of pain may be proved by lay testimony; whether or not the negligence of the physician was the primary cause thereof must be established by expert testimony. Where expert testimony discloses nothing more than an error of judgment, the physician is not guilty of malpractice. In the present case, the court concluded that the plaintiff had failed to prove that the defendant had left undone something that he should have done or that he had done something that he should not have done. Accordingly, the court affirmed the judgment for the defendant.—*Meador v. Arnold (Ky.), 94 S. W. (2d) 626.*

Malpractice: Alleged Puncture of Common Bile Duct During Removal of Gallbladder.—The plaintiff in 1931 suffered from a "gallbladder attack." A second attack occurred in July 1932 and a third late in December of that year. The defendant-physicians attended the plaintiff, and roentgenograms taken in August 1932 and in January 1933 showed the presence of gallstones in the gallbladder. An operation was performed by the defendants June 6, 1933, and the gallbladder removed. During this operation, it was contended, a probe was inserted through the walls of the common duct and that thereafter bile escaped into the abdominal cavity, resulting in the subsequent illness of the plaintiff. The trial court, in a malpractice suit instituted by the plaintiff, directed a verdict for the defendants. The plaintiff died during the pendency of her motion for a new trial, and the administratrix of her estate was substituted as party plaintiff. The motion for a new trial was denied and the administratrix appealed to the Supreme Court of Minnesota.

Concededly, said the Supreme Court, the defendants were qualified and experienced physicians and surgeons in good standing and possessed at least the average skill of physicians and surgeons practicing in their community. While a physician is not an insurer of a cure or good results, he is required to possess the skill and learning possessed by the average member of his school of the profession in good standing in his locality and is required to apply that skill and learning with due care. Two medical experts testified for the plaintiff but neither stated that a puncture or opening was made in the common duct by the defendants during the operation for the removal of the gallbladder. Neither expressed an opinion as to whether the ailments and complications suffered by the plaintiff following the operation resulted from an operative puncture of the wall of the common duct or from a failure of the defendants to exercise proper care and skill as surgeons. One of these witnesses testified that in his opinion the plaintiff's condition was due to infection of the biliary tract and that such conditions result "time and again" in cases in which the operating surgeon has exercised all due care and skill, and that the plaintiff's condition was not indicative of any lack of skill or want of care on the part of the operating surgeons. The other witness testified that the plaintiff's condition indicated gallbladder disease and possible infection in the biliary tract prior to the date of the operation and that there was some chronic inflammation in the gallbladder beginning as early as 1931, when the plaintiff experienced her first attack. Both experts agreed that a gallbladder operation was serious and sometimes results in complications or death in spite of the exercise of the best skill and care on the part of the operating surgeon. The evidence as a whole, in the opinion of the court, was insufficient to sustain a finding that the infection was caused by any failure of the defendants to exercise the care and skill required of them.

In malpractice cases, proof of causal connection between the injury and the alleged neglect of the physician must be something more than consistent with the plaintiff's theory of how the claimed injury was caused. The burden is on the plaintiff to show that it is more probable that the harm resulted from some negligence for which the defendant-physician was responsible than in consequence of something for which he was not responsible. No presumption of negligence arises from the fact that an operation or treatment by a surgeon or physician does not result in a cure. The doctrine of res ipsa loquitur is not applicable. The plaintiff having failed to meet the burden of proof imposed on her, the trial court did not, in the opinion of the Supreme Court, err in directing a verdict for the defendants.—*Yates v. Gamble (Minn.), 268 N. W. 670.*

Society Proceedings

COMING MEETINGS

American Medical Association, Atlantic City, N. J., June 7-11. Dr. Olin West, 535 North Dearborn St., Chicago, Secretary.

American Academy of Tuberculosis Physicians, Atlantic City, N. J., June 7-8. Dr. Arnold Minnig, 638 Metropolitan Bldg., Denver, Secretary.

American Association for the Study and Control of Rheumatic Diseases, Atlantic City, N. J., June 7. Dr. Loring T. Swaim, 372 Marlborough St., Boston, Secretary.

American Association for the Study of Goiter, Detroit, June 14-16. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.

American Association of Genito-Urinary Surgeons, Quebec, Canada, June 14-16. Dr. Henry L. Sanford, 1621 Euclid Ave., Cleveland, Secretary.

American Gastro-Enterological Association, Atlantic City, N. J., June 7-8. Dr. Russell S. Boles, 1901 Walnut St., Philadelphia, Secretary.

American Heart Association, Atlantic City, N. J., June 7-8. Dr. Howard B. Sprague, 50 West 50th St., New York, Secretary.

American Physiotherapy Association, St. Paul, June 27-July 1. Miss Jefferson I. Brown, Tichenor Hospital School, Long Beach, Calif., Secretary.

American Proctologic Society, Atlantic City, N. J., June 6-8. Dr. Curtice Rosser, 710 Medical Arts Bldg., Dallas, Texas, Secretary.

American Radium Society, Atlantic City, N. J., June 7-8. Dr. William P. Healy, 121 East 60th St., New York, Secretary.

American Urological Association, Minnesapolis, June 29-July 1. Dr. Clyde L. Deming, 789 Howard Avenue, New Haven, Conn., Secretary.

Associated Anesthetists of the United States and Canada, Atlantic City, N. J., June 7-8, Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary-General.

Association for the Study of Allergy, Atlantic City, N. J., June 7-8. Dr. Warren T. Vaughan, 201 West Franklin St., Richmond, Va., Secretary.

Association for the Study of Internal Secretions, Atlantic City, N. J., June 7-8. Dr. E. Kost Shelton, 921 Westwood Blvd., Los Angeles, Secretary.

Maine Medical Association, Belgrade Lake, June 20-23. Miss Rebekah Gardner, 22 Arsenal St., Portland, Secretary.

Medical Women's National Association, Atlantic City, N. J., June 6-8. Dr. F. S. Fetterman, 7047 Germantown Ave., Philadelphia, Secretary.

Montana, Medical Association of, Great Falls, July 13-14. Dr. E. G. Balsam, 208½ North Broadway, Billings, Secretary.

Pacific Northwest Medical Association, Great Falls, Mont., July 8-10. Dr. C. W. Countryman, 407 Riverside Ave., Spokane, Wash., Secretary.

Rocky Mountain Medical Conference, Denver, July 19-21. Mr. Harvey T. Sethman, 1612 Tremont Place, Denver, Secretary.

Vancouver Medical Association Summer School, Vancouver, B. C., June 22-25. Dr. J. R. Naden, 203 Medical-Dental Bldg., Vancouver, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1926 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them. Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

13: 257-386 (March) 1937

*Vascular Complications of Polycythemia. I. L. Norman and E. V. Allen, Rochester, Minn.—p. 257.
Significance of Bleod Vessels in Human Heart Valves. L. Gross, New York.—p. 275.
Studies in Cardiovascular Syphilis: I. Teleroentgenography in Diagnosis of Early Syphilitic Aortitis: Comparison of Findings in 1,000 Syphilitic and 600 Nonsyphilitic Individuals. J. E. Kemp and K. D. Cochems, Chicago.—p. 297.
Electrocardiogram in Hypertension, with Especial Reference to Lead IV. C. L. C. van Nieuwenhuizen and H. A. P. Hartog, Utrecht, Netherlands.—p. 308.
Coronary Thrombosis: Investigation of Heart Failure and Other Factors in Its Course and Prognosis. A. M. Master, S. Dack and H. L. Jaffe, New York.—p. 330.
Trigonoidation of Semilunar Valves and Its Relationship to Certain Basal Systolic Murmurs. D. R. Chisholm, Honolulu, Hawaii.—p. 362.

Vascular Complications of Polycythemia.—About one third of the ninety-eight patients with polycythemia vera that were observed at the Mayo Clinic from January 1929 to 1936 had vascular complications, which Norman and Allen state indicates that polycythemia was responsible for the vascular diseases in most instances since the latter affect a much smaller proportion than one third of all patients of similar ages and sex. Moreover, this hypothesis is logical, as the conditions in the blood are those which produce an increased tendency to thrombosis. The situation is not so clear in relative polycythemia, in which the disturbances in the blood are frequently minimal. It is probable that the changed status of the blood is not responsible for the vascular lesions in the majority of cases of relative polycythemia. For example, polycythemia is rare in thrombo-angiitis obliterans. Naturally, the fundamental disturbance may, in some obscure manner, produce thrombo-angiitis obliterans and relative polycythemia. These observations regarding thrombo-angiitis obliterans apply to arteriosclerosis obliterans, and with less certainty to erythromelalgia and vasospastic neurosis. Phlebitis and cerebrovascular hemorrhage or thrombosis may have resulted directly from polycythemia, but the authors have no evidence that this is so. It is advisable to treat polycythemia vera if for no other reason than to prevent vascular complications. If the many vascular diseases are viewed with the suspicion that polycythemia vera exists, it will be found in at least a small percentage of cases. It appears that arteriosclerosis obliterans and thrombo-angiitis obliterans respond in a better manner to treatment if polycythemia which may be present is treated actively.

American Journal of Medical Technology, Detroit

3: 34-68 (March) 1937

*Laboratory Recognition of Monilia. Ann Snow, Little Rock, Ark.—p. 34.
Hemologic Observations on Anemias and Leukemias: III. Blood Patterns in Anemia Due to Hemorrhage. E. A. Sharp and E. M. Schleicher, Detroit.—p. 40.
Folin Berglund Method for Quantitative Determination of Glucose in Urine. Bernice Elliott, Omaha.—p. 49.
Heritage of Clinical Laboratory. Vivian Herrick, University, Ala.—p. 53.

Laboratory Recognition of Monilia.—Snow points out that, besides the fact that Monilia may be associated with a variety of disease processes, some organisms of this group may be found in the throat, mouth and intestine of healthy individuals. Moreover, laboratory contamination by Monilia may occur. Therefore it is advisable to make repeated examination of pathologic material in order to make sure that the parasites can be found more than once. This will strengthen the assumption that the organisms are present in the lesion. In an examination of sputum for bronchomoniliasis, for example, contamination from the mouth must be eliminated as far as possible. Early diagnoses are important, as it is possible for the parasite to invade the blood stream with the production of metastatic abscesses. The fact that the practitioner sometimes confuses a membrane caused by a monilia with a diphtheritic membrane also emphasizes the necessity for the laboratory technician to have a well defined knowledge of this organism. The isolation and identification procedures applicable to the study of Monilia are generally tedious and slow. Not only is it necessary to consider such morphologic features as spore formation, size and appearance of mycelium, size, shape and location of moniliform clusters, but also there should be correlation with the fermentation tests.

American J. Obstetrics and Gynecology, St. Louis

33: 547-728 (April) 1937. Partial Index

Anatomic Description of Case of Marginal Placenta Praevia: Discussion of Etiologic Implications. D. G. Morton, San Francisco.—p. 547.
Ventrosuspension of Uterus with Living Sutures: Preliminary Report. E. M. Hodgkins, Boston.—p. 559.
Report on Radiation Treatment of Cancer of Corpus and Cervix Uteri from the Brooklyn Hospital. W. S. Smith, Brooklyn.—p. 596.
Oral Paraldehyde Administration in Obstetrics: Supplementing Pentobarbital and Pantopon as an Analgesic and Amnesic in Labor: Preliminary Report of Fifty Cases. L. H. Douglass and F. W. Peyton, Baltimore.—p. 604.
Primiparous Internal Genitalia After Forceps Delivery: Follow-Up Study of Cervical Lacerations and Malposition. F. B. Nugent, Reading, Pa.—p. 611.
*Suprarenal Cortex Therapy in Vomiting of Pregnancy: II. Results in Seventy-Eight Cases. W. Freeman, J. M. Melick and D. K. McClusky, Worcester, Mass.—p. 618.
Diagnostic Value of X-Ray in Palcenta Praevia. S. C. Hall, F. W. Currin, Brooklyn, and J. F. Lynch, Burlington, Vt.—p. 625.
Acute Edema of Cervix in Pregnancy and Labor. W. F. Seeley, Detroit.—p. 631.
Pituitary Radiation for Relief of Menopause Symptoms. S. H. Geist and M. Mintz, New York.—p. 643.
Granulosa Cell Tumor Without Uterine Bleeding. W. B. P. McDonough, Brooklyn.—p. 657.
Peripheral Gangrene Following Pregnancy. J. L. O'Leary, Brooklyn.—p. 662.
Sickle Cell Anemia with Pregnancy. A. W. Lewis Jr., St. Augustine, Fla.—p. 667.
Cyclic Phenomena Associated with Menstruation, Early Pregnancy and Induced Abortion in Healthy Woman. C. G. Hartman, Baltimore, and R. Squier, New York.—p. 690.
Elliott Treatment as Prophylaxis for Gonorrhea in the Female. G. A. Williams, Atlanta, Ga.—p. 694.

Adrenal Cortex Therapy in Vomiting of Pregnancy.—Freeman and his associates treated seventy-eight pregnant women for nausea and vomiting with adrenal cortex after the remedies commonly used for this condition failed. The less severe cases of nausea and vomiting were treated exclusively with tablets; the more severe cases were treated at first with parenteral injections. Of the forty-seven treated patients with less severe nausea and vomiting, only two failed to receive any benefit. There were fifteen patients who had severe nausea and vomiting and sixteen patients who were classed as having pernicious vomiting. A cure was effected with the parenteral treatment in every instance within from three to five days. It is important to note that in no instance did the condition of nausea and vomiting become more severe, necessitating the interruption of pregnancy. In the more severe cases of nausea and vomiting, the body fluids and vitamins were replaced as rapidly as possible. In patients in whom the ketosis did not clear as rapidly as the clinical symptoms, insulin was added to the intravenous medication. No contraindications of the use of adrenal cortex have been encountered. The patients, who were merely nauseated or who vomited but rarely or at regular intervals, were told to take one tablet (0.2 Gm.) three times a day, about one-half hour before their regular meal. If at the end of a week their symptoms had not completely ceased, the dose was increased up to six tablets a day. For patients who vomited at irregular intervals or who vomited everything taken by mouth the contents of one ampule (1 cc.) of adrenal cortex were injected three times a day, about one-half hour before mealtime. The injections were continued for three days after the disappearance of all signs of vomiting; then one ampule was replaced by one tablet on each successive day, so that by the end of the sixth day after cessation of vomiting the patient was receiving three tablets a day and no injections. The tablets were then continued until 100 had been taken.

American Review of Tuberculosis, New York

35: 411-596 (April) 1937

Thoracoplasty with Lung Mobilization: Part I. First-Stage Operation. R. H. Overholt, Boston.—p. 417.
Id.: Part II. Second-Stage and Subsequent-Stage Operations. R. H. Overholt, Boston.—p. 430.
Review of 200 Consecutive Thoracoplasties. R. G. Urquhart, Norwich, Conn.—p. 443.
Complications of Successful Thoracoplasties. A. H. Aufses, New York.—p. 464.
Phrenic Interruption Combined with Artificial Pneumothorax for Pulmonary Tuberculosis. F. R. Harper, Tucson, Ariz.—p. 475.
Selective Collapse in Artificial Pneumothorax: Consideration of Its Development. R. T. Ellison, Chestnut Hill, Pa.—p. 484.
Review of 100 Reexpanded Cases of Artificial Pneumothorax. E. P. Eglee and O. R. Jones, New York.—p. 500.
Frequency of Artificial Pneumothorax Refills in Tuberculosis: Preliminary Report. R. M. Franklin, W. A. Zavod and H. E. Perez, Valhalla, N. Y.—p. 513.
*Emphysema of Artificial Pneumothorax Lung: Vesicular, Subpleural, Interfascial. E. Korol, Lincoln, Neb.—p. 530.
Empyema Complicating Artificial Pneumothorax. F. Y. Leaver and R. M. Hardaway, Denver.—p. 538.
Tuberculous Effusions Complicating Artificial Pneumothorax. B. L. Brock, A. B. Mullen and T. A. Woodson, Waverly Hills, Ky.—p. 548.
Use of Graphic Records in Artificial Pneumothorax. B. Gordon, Philadelphia.—p. 561.
New Artificial Pneumothorax Apparatus. S. Hirsch, New York.—p. 570.
An Hour-Glass Artificial Pneumothorax Apparatus. M. S. Lloyd, New York.—p. 572.
Surgery of the Tuberculous Belongs to the Sanatorium. E. L. Ross, Ninette, Manit.—p. 575.
Necessity of Bronchoscope in Modern Chest Work. M. G. Buckles, Waverly Hills, Ky.—p. 581.
Bronchography with Iodized Oil Not Without Danger: Report of Case. L. Schneider and J. Segal, New York.—p. 590.

Emphysema of Artificial Pneumothorax.—Korol states that in certain cases of artificial pneumothorax the treated lung presents transparent areas which on the roentgenogram appear as bright as or brighter than the air in the pneumothorax cavity. In practically all cases described in the literature there was a pleural exudate of long duration. In the majority of cases there were signs of bronchial fistula, such as high pressures in the pneumothorax, purulent effusions rich in tubercle bacilli or attacks of spontaneous pneumothorax. In all the cases the lung collapse was incomplete, owing to adhesions that existed prior to the induction of the pneumothorax. The author believes that this phenomenon is caused by (1) a progressive pachypleuritis, which thickens the pleura overlying the pneumothorax but spares the treated lung owing to preexistent adhesions, (2) areas of vicarious emphysema in the adherent lung and (3) air pockets between strands of adhesions or between the lung and the visceral pleura.

Archives of Otolaryngology, Chicago

25: 363-486 (April) 1937

*Osteomyelitis of Frontal Bone Resulting from Extension of Suppuration of Frontal Sinus: Surgical Treatment. A. W. Adson and B. E. Hempstead, Rochester, Minn.—p. 363.
Proposed Operation for Osteomyelitis of Inferior Aspect of Petrous Pyramid. M. C. Myerson, New York; R. Blumberg and H. W. Rubin, Brooklyn.—p. 373.
Pulmonary Collapse Following Tonsillectomy Under Local Anesthesia: Report of Case. S. Iglauer, Cincinnati.—p. 382.
Laryngoptosis: Ptosis of Larynx Due to Downward Displacement of Hyoid Bone Resulting from Fibrosis and Shortening (Congenital Anomaly) of Left Sternohyoid and Sternothyroid Muscles. G. Tucker, Philadelphia.—p. 389.
Treatment of Asthmatic Patients in Otolaryngologic Practice. N. Fox and J. W. Harned, Chicago.—p. 393.
Intratracheal Inhalation Anesthesia: Review of Ten Years' Experience, with Especial Reference to Its Field of Usefulness, Details of Technic and Objections Raised Against the Method. P. J. Flagg, New York.—p. 405.
Bronchiectasis in Children, with Especial Reference to Prevention. G. B. Ferguson, Albuquerque, N. M.—p. 430.
Nasal Obstruction in the Adult: Quantitative Study. H. J. Sternstein, Boston.—p. 442.
Aberrant Goiter: Report of Instance of Intralaryngeal Thyroid Tumor. H. B. Beeson, Racine, Wis.—p. 449.
Otitic Meningitis. R. Schillinger, Brooklyn.—p. 455.
Great Vessels in Deep Infection of the Neck. L. C. Boemer, St. Louis.—p. 465.

Osteomyelitis of Frontal Bone.—Adson and Hempstead employ a procedure that prevents the usual deformity that follows an operation on the frontal sinus and permits the removal of all sequestrums and thorough drainage of the frontal sinus by removing the posterior table of the sinus. The surgical principles include (1) adequate drainage of the frontal sinus, (2) removal of pus, necrotic bone and all white dead bone, (3) preservation of the periosteum if possible and (4) concealing the incisions of the scalp within the hair line. The last principle is accomplished by employing a coronal incision placed in the hair line. The incision should extend through the scalp to include the periosteum. It is not only important to remove the sequestrum, the island of necrotic bone, but it is likewise important to remove the adjacent dead bone even though it involves both tables of the skull. If a small island of avascularized bone remains it will act as a source for continuous drainage and cause further extension of the infective process. However, it is not necessary to remove living or bleeding bone. After complete sequestrectomy and the exenteration of the frontal sinus, the entire surgical field is washed with pure tincture of iodine. The frontal sinus is packed with gauze soaked in tincture of iodine. Additional strips of similar gauze are laid in the bony channel, and all are brought out through the line of suture. Extraperiosteal infection and infection of the scalp, if present, are drained by incisions through the periosteum from underneath the flap. Injury to the periosteum covering the defect over the craniotomy should be avoided, since the preservation of the periosteum stimulates the formation of new bone and the filling of the defect. The gauze drains are shortened daily and are completely removed by the third postoperative day. The removal of necrotic bone, the complete posterior exenteration of the frontal sinus and the free use of the tincture of iodine result in primary healing of the operative wound. Extensive sequestrectomy as employed at the Mayo Clinic has been used innumerable times for other osteomyelitic processes involving cranial bones. It has proved to be much more effective in cleaning up an extensive process than has drainage by a mere stab wound and the curettement of localized regions. Abscess of the brain invariably develops if improper drainage is instituted or if the infection is allowed to continue.

Arkansas Medical Society Journal, Fort Smtih

33: 187-206 (April) 1937

Sedimentation Test in Chronic Arthritis: Its Value as an Aid to Differential Diagnosis and Treatment. M. F. Lautman, Hot Springs National Park.—p. 187.
Organized Medicine: A Few Facts Concerning Its History and Value. M. J. Kilbury, Little Rock.—p. 189.
Sarcoma of the Breast: Case Report. Ruth Ellis, Fayetteville.—p. 193.

Canadian Medical Association Journal, Montreal

36: 339-448 (April) 1937

*Clinical Study of Silicosis. H. H. Moore and M. J. Kelly, Timmins, Ont.—p. 339.
Gastroscopy: Its Indications and Value. P. H. T. Thorlakson and C. B. Stewart, Winnipeg, Manit.—p. 345.
Echinococcus Alveolaris: Report of Case. E. James and W. Boyd, Winnipeg, Manit.—p. 354.
Haematemesis Following Appendectomy. G. H. Kitchen, New York.—p. 357.
Bilateral Congenital Absence of Radii. A. E. Harbeson, Kingston, Ont.—p. 359.
Primary Sarcoma of Uveal Tract: Analysis of Twenty-Seven Cases. S. H. McKee, Montreal.—p. 361.
Trend of Diabetes in Saskatchewan, 1905 to 1934. Lillian A. Chase, Regina, Sask.—p. 366.
Antipneumococcus Serum in Pneumonia. G. C. Anglin and M. H. Brown, Toronto.—p. 370.
Toxemias of Pregnancy. R. Mitchell, Winnipeg, Manit.—p. 376.
Comparison of Total Hysterectomy versus Supravaginal Hysterectomy. J. J. Mason, Vancouver, B. C.—p. 380.
*The Size of the Heart After Coronary Thrombosis. J. H. Palmer, Montreal.—p. 387.
Experimental Arsphenamine Dermatitis: Influence of Vitamin C in Production of Arsphenamine Sensitiveness. F. E. Cormia, Montreal.—p. 392.
Estrogenic Hormones in Treatment of Vulvovaginitis in Children. J. V. Berry, Ottawa, Ont.—p. 396.
Cysts of Semilunar Cartilages of Knee Joint. D. M. Meekison, Vancouver, B. C.—p. 399.
Additional Note on Innervation of Tumors. H. Oertel, Montreal.—p. 401.

Clinical Study of Silicosis.—On the basis of a clinical investigation of 203 gold miners, Moore and Kelly find that it may be possible to recognize the miner who will develop silicosis, before the appearance of the usual signs, by lowered basal metabolism and pulse rates. Thyroid therapy may possibly not only prevent the development of silicosis but also

V 10
1937

arrest its further progress and possibly reduce to some extent the degree of fibrosis already existing. Social and living conditions and diet are quite uniform among miners and evidently do not affect the development of silicosis. There was no evidence to show that liver, kidney or heart disease was associated with dust inhalation. A large proportion of silicotic patients have shortness of breath in varying degrees. Those studied had a lowered basal metabolic rate and slow pulse, which might be a compensating factor in reducing cardiac output with lessened heart strain and account for the large number of normal-shaped hearts in cases of longstanding silicosis. This is contrary to what one would expect in the presence of diffuse lung fibrosis. The presence of definite evidence of heart disease in a silicotic patient disabled from shortness of breath would certainly point to the fact that part of the disability is due to heart disease. The authors, however, know of no way to determine what proportion of the disability should be apportioned to one or other cause of the disability.

Size of the Heart After Coronary Thrombosis.—Palmer bases his clinical observations on the incidence and cause of cardiac enlargement on an analysis of 200 cases in which the attack was survived at least three months. The size of the heart was determined by x-ray study in every case. It invariably consisted of fluoroscopy in the anteroposterior and right and left oblique positions, frequently supplemented by orthodiagram and/or teleroentgenogram. Cardiac enlargement was found in 128 (64 per cent); thirty-two cases in which the report was "enlargement doubtful" were not included in this percentage but were classified as normal. By far the most important factor causing enlargement proved to be hypertension, which was held to be the single or predominant cause in more than 80 per cent of all cases with enlargement. Disease of the coronary arteries, either the actual thrombosis with its resulting infarction or the underlying arteriosclerosis, led to increase in the size of the heart in a total of eleven cases. No example of so-called acute dilatation of the heart was discovered among twenty-seven patients examined within a month of the attack. Congestive failure, which was not seen in hearts of normal size, seldom led to an appreciable increase in the degree of enlargement. About a third of the patients (36 per cent) failed to show or to develop enlargement, though observed over periods averaging more than three years following the first attack of coronary thrombosis. This number included several with recurrent attacks.

Indiana State Medical Assn. Journal, Indianapolis

30: 177-226 (April) 1937

*Water Metabolism. F. A. Coller, Ann Arbor, Mich.—p. 177.
Anesthesia for Thyroid Surgery. L. F. Sise, Boston.—p. 180.
Treatment of Disturbances of Thyroid and Parathyroids and of Anterior Pituitary and Gonads. E. L. Sevringhaus, Madison, Wis.—p. 185.
The Service of the American Medical Association to Society. C. G. Heyd, New York.—p. 190.
Repair of Depressed Disfiguring Scars by Means of Rib Cartilage Implant. H. M. Trusler, Indianapolis.—p. 194.
Traumatic Aneurysms of the Extremities. W. D. Little, Indianapolis.—p. 196.
Cerebrospinal Rhinorrhea: Report of Unusual Case. H. C. Wurster, Mishawaka.—p. 199.

Water Metabolism.—Coller points out that abnormal losses of fluid, such as through vomiting, diarrhea, drainage from fistulas or exudations from large ulcers, are frequently of huge volume and must be carefully measured, recorded and replaced. Such losses, continued over a number of days and inadequately restored, will often lead to dehydration in spite of what appears to be a generous intake of fluid. A negative water balance should always be suspected and eliminated whenever dealing with cases of oliguria or anuria of no obvious cause. In order to maintain the water balance of a patient who cannot use his gastro-intestinal tract, 2 liters should be allowed for the loss through vaporization, 1.5 liters for the urine and to this a quantity equal to whatever amount the patient is vomiting or losing otherwise should be added. Secondly a dehydrated patient should be given fluid equal to 6 per cent of his body weight and then treated as one whose water balance is being maintained. Loss from the gastro-intestinal tract should be replaced by physiologic solution of sodium chloride and the remainder of the fluid given as 5 per cent dextrose in distilled water.

Iowa State Medical Society Journal, Des Moines

27: 139-182 (April) 1937

Clinical Management of Diabetes Mellitus Using Protamine Zinc Insulin. E. B. Winnett, Des Moines.—p. 150.
Coccygodynia: Study of End Results of Treatment. W. R. Hamsa, Iowa City.—p. 154.
Parenteral Oxygen Administration. T. Stuckart, Dubuque.—p. 156.
Diagnostic Mistakes. R. L. Gorrell, Clarion.—p. 159.

Johns Hopkins Hospital Bulletin, Baltimore

60: 223-312 (April) 1937

Boeck's Sarcoid (Sarcoidosis). W. T. Longcope and J. W. Pierson, Baltimore.—p. 223.
*Use of Para-Amino-Benzene-Sulfonamide or Its Derivatives in Treatment of Beta Hemolytic Streptococcic Meningitis. F. F. Schwentker, F. P. Clason, W. A. Morgan, J. W. Lindsay and P. H. Long, Baltimore.—p. 297.

Treatment of Beta-Hemolytic Streptococcus Meningitis.—Schwentker and his collaborators used sulfanilamide or its derivatives in the treatment of four cases of meningitis due to beta-hemolytic streptococci. Two of the patients had a primary otitic focus and one a traumatic focus (craniotomy wound), and in the fourth no purulent focus was discovered. In three patients surgical intervention (mastoidectomy, exploratory craniotomy) accompanied therapy with sulfanilamide or its derivatives. Three patients received intraspinal therapy with these chemicals while, in the other patient, oral therapy alone was used. Three patients recovered and one died. It appears that sulfanilamide or its derivatives offer the possibility of a specific chemotherapeutic approach to the treatment of beta-hemolytic streptococcus meningitis. A combination of oral and intraspinal therapy seems to deserve a thorough trial. If the patient is not nauseated and can swallow, treatment should be started with sulfanilamide by mouth and also by the intraspinal route. Tablets are used for oral administration. The total dose for the first twenty-four hours is calculated on the basis of three tablets (1 Gm.) to each 20 pounds (9 Kg.) up to 100 pounds (45 Kg.) of body weight. For adults with acute infections the authors believe that 5 Gm. of this substance represents the maximal daily dose. This total amount is divided into four doses given at intervals of six hours. In preparing the drug for clinical use it is their practice to dissolve 0.8 Gm. in 100 cc. of physiologic solution of sodium chloride which has been brought to the boiling point and then cooled to about 90 C. Such 0.8 per cent solutions of sulfanilamide may be used intrathecally. The general practice in administering the drug intrathecally should closely follow that recommended for the use of antimeningococcus serum in meningococcic meningitis, namely, that rather complete spinal drainage by lumbar puncture should be instituted and then from 15 to 25 cc. of a warm, freshly prepared, 0.8 per cent solution of sulfanilamide should be permitted to flow in by gravity. If the patient cannot swallow tablets, parenteral therapy by the subcutaneous route with either hydrochloride of 2:4 diaminoazo-benzene-4' sulfonamide or an 0.8 per cent solution of sulfanilamide in sterile physiologic solution of sodium chloride may be instituted. With the former solution, 1 cc. per pound of body weight constitutes the total daily dose. This is divided into four equal doses given at intervals of six hours. If 0.8 per cent sulfanilamide solution is used, it should be given as a hypodermoclysis in the following amounts: For patients weighing up to 40 pounds (18 Kg.) 100 cc., from 40 to 80 pounds (18 to 36 Kg.) 200 cc., from 80 to 120 pounds (36 to 54 Kg.) 300 cc., and for those weighing more than 120 pounds 400 cc. in twenty-four hours. Therapy should be continued at the advised level until the spinal fluid has been rendered sterile for at least forty-eight hours and a marked general improvement in the patient's condition has occurred. At this point the intraspinal therapy may be discontinued and the amount of the drug given by mouth reduced by one third. Adequate oral therapy should be maintained until the patient is entirely well. Surgical procedures designed to eradicate septic foci are indicated in streptococcic meningitis as an adjunct to specific therapy, but extensive surgical intervention should not be resorted to until the infection has been brought under control by specific therapy.

Journal of Comparative Neurology, Philadelphia

66: 1-300 (Feb.) 1937

Cellular Morphology in Area Postrema. L. S. King, Princeton, N. J.—p. 1.
Ontogenetic Development of Diencephalic Centers in a Bird's Brain (Chick) and Comparison with the Reptilian and Mammalian Diencephalon. H. Kuhlenbeck, Philadelphia.—p. 23.
Development of Vascularity in the Hindbrain of the Chick. R. G. Williams, Philadelphia.—p. 77.
First Study of Size of Cells in Cerebral Cortex. G. von Bonin, Chicago.—p. 103.
Experimental Study of Optic Tracts and Retinal Projection of Virginia Opossum. D. Bodian, Chicago.—p. 113.
Thalamic Nuclei of Macaca Mulatta: Note. A. E. Walker, Chicago.—p. 145.
Development of Behavior in Avian Embryos. H. Tuge, Sendai, Japan.—p. 157.
Further Experimental Investigations on Phenomenon of Homologous Response in Transplanted Amphibian Limbs: I. Functional Observations. P. Weiss, Chicago.—p. 181.
Visual Centers in Blinded Rats. Y.-C. Tsang, Chicago.—p. 211.
Topography of the Brain Stem of Rhesus Monkey, with Especial Reference to Diencephalon. D. Atlas and W. R. Ingram, Chicago.—p. 263.
Topography of Pretectal Area of Monkey: Note. D. Atlas and W. R. Ingram, Chicago.—p. 291.

Kentucky Medical Journal, Bowling Green

35: 169-220 (April) 1937

Chorionepithelioma. J. H. Caldwell, Newport.—p. 172.
The Management of Epidemic Cerebrospinal Meningitis in an Industrial Community. C. R. Petty, Lynch.—p. 180.
Healing Processes in Tuberculosis. C. H. Cocke, Asheville, N. C.—p. 185.
Abuses of Physical Energies in Practice of Medicine and Surgery. A. D. Willmoth, Louisville.—p. 190.
Functional Heart Disease in Childhood. R. B. Warfield, Lexington.—p. 196.
Treatment of Different Types of Edema. F. M. Travis, Frankfort.—p. 199.
Fractures of the Elbow. R. T. Hudson, Louisville.—p. 202.
Diagnosis and Treatment of Lesions of External Male Genitalia. W. U. Rutledge, Louisville.—p. 204.
Present-Day Management of Surgical Lesions of Stomach and Duodenum. F. W. Rankin, Lexington.—p. 209.
*Interpretation of Gastric Pain. F. M. Sherman, Owensboro.—p. 215.

Interpretation of Gastric Pain.—Sherman confines his discussion to pain in the upper part of the abdominal region or gastric area. The painful diseases of the stomach belong, according to nomenclature, to three main groups: inflammations, ulcerations and new growths. Stomach pain is nearly always epigastric, occasionally it may be referred to the left or to the right, but as a rule it is situated in the pit of the stomach. In inflamed conditions of the stomach the pain is likely to appear soon after eating. There is no group of digestive diseases that gives the same degree of periodicity and rhythmicity to pain as does peptic ulcer. Gastric ulcer nearly always gives pain within one to two hours after taking of food, while duodenal ulcer is somewhat later. In every instance one must rule out organic disease of the central nervous system. One of the commonest causes of pain in the epigastric region is gallbladder disease. It is responsible for more gastric disturbance, so-called indigestion and flatulence than anything else. Pancreatic disease in its chronic form resembles gallbladder disease in its annoying persistence. The relationship to food is not so clearly drawn as it is in gastric or duodenal disease. Situated on the posterior wall of the body, the pain is frequently referred to the back, although it may persist in the epigastrium. Splenic disease may be an exceedingly painful condition, but the pain is usually located in the left hypochondriac region. Other causes of pain in the gastric region may be enumerated as follows: epigastric hernia, postoperative hernia, adhesions, perigastritis, diverticulitis (more particularly of the duodenum), hepatitis, retroperitoneal growths, tubercular obstructions and many lesser conditions. There are many disorders causing epigastric pain that are not due to stomach disease which may exist and so affect the stomach directly or reflexly that the clinical picture may suggest stomach disease rather than the true condition. Esophageal disease frequently becomes manifest on deglutition, stomach disease as ulcer about two hours after eating, duodenal disease about three or four hours after taking food, and gallbladder, pancreatic and hepatic conditions four or five hours after eating, while colon disease manifests itself during defecation. Genito-urinary disease is usually manifested during the act of micturition, and evidence of spinal, skeletal or muscular disease when active function of the part involved is demanded. Other conditions that may be misleading are influences through the blood stream, the various allergic conditions, acute infectious diseases, such as measles, lead poisoning, and undulant and rheumatic fevers. Herpes zoster may mimic an acute abdominal condition in its early stage, before the appearance of the characteristic rash; ordinarily the pain and other symptoms are not sufficiently marked to suggest an intra-abdominal or gastric lesion.

Maine Medical Journal, Portland

28: 71-88 (April) 1937

Blood Sugar Determination Valueless Unless Drawn and Examined with Special Precaution. A. J. Stinchfield, Skowhegan.—p. 71.
Gallbladder Problems. C. M. Robinson, Portland.—p. 74.
Uses and Limitations of Barbiturates in General Practice. P. L. Gray, South Brooksville.—p. 76.
Hormone Treatment of Some Functional Gynecologic Disorders. A. H. McQuillan, Waterville.—p. 83.

Michigan State Medical Society Journal, Lansing

36: 211-262 (April) 1937

Recent Advances in Nutritional Research: Beaumont Foundation Lectures Before the Wayne County Medical Society, Detroit. E. V. McCollum, Baltimore.—p. 211.
Empyema and Its Management. G. C. Penberthy and C. D. Benson, Detroit.—p. 227.
Serum Treatment of Pneumococcic Peritonitis. W. B. Cooksey, Detroit.—p. 232.
Clinical Study with Insulin Protamine. J. H. Chalat and Alice H. Smith, Detroit.—p. 234.

New England Journal of Medicine, Boston

216: 539-586 (April 1) 1937

Surgical Treatment of Certain Repeated Explosive Attacks of Vertigo Occurring in Absence of Any Demonstrable Etiology—Ménière's Disease: Report of Fourteen Cases of This and Other Types of Aural Vertigo and Including One Case Involving Both Vestibular Nerves. D. Munro, Boston.—p. 539.
*Neurofibromatosis with Intrathoracic Neurofibromas. N. Epstein, Boston.—p. 551.
Tannic Acid-Silver Nitrate Treatment of Burns in Children. M. B. Low, Deerfield, Mass.—p. 553.
Benign Tumors of the Scrotum: Report of Three Cases. E. R. Mintz, Boston.—p. 557.

Intrathoracic Neurofibromas.—Epstein reports the case of an Armenian girl, aged 4 years, with large tumors of the chest, admitted to the Boston Floating Hospital in the winter of 1935. Her past history was negative up to December 1933, when a small lump in the right axilla was noted. Roentgenograms revealed a large thoracic shadow in the right apical region, and a diagnosis of probable neurofibroma was made. Permission to perform an operation was refused at this time, but she was rehospitalized later because of the persistence of the chest mass. Clinically the patient presented no unusual features. Operation was performed in January 1936 under basal tribromethanol anesthesia and intratracheal ether-oxygen with differential pressure. A curved incision was made posteriorly, releasing the scapula, which was retracted anteriorly. There were large neuromas beneath the skin and in the substance of the trapezius and rhomboid muscles. When the bony wall of the chest had been exposed, the perforating branches of the intercostal nerves were found to be grossly enlarged by fusiform swellings. The second to fourth ribs were divided and the pleural cavity was opened. The apex of the chest was filled by a large tumorous mass that lay close against the vertebral column and extended laterally and anteriorly in such a way that it impinged on the chest wall. The spinal nerves entered this mass directly from the vertebral foramina. These roots were severed and a large mass of neurofibromatous tissue was removed. The first rib was left intact to protect the subclavian vessels and the important cords of the plexus, but, in view of the subsequent partial palsy of the ulnar and median nerves, the first dorsal root of the plexus was injured, presumably, by traction. After the tumor had been removed, the chest wall was closed in layers without drainage. Within two months after the operation the mass in the neck increased in size. The presence of a firm "ropey" tissue was observed, extending from the right axilla along the course of the median nerve to the anterior cubital fossa and thence to the midwrist. This tissue was most pronounced in the upper part of the middle arm, where a hard mass was felt. A partial paralysis of the median and ulnar nerves occurred on the right side with a

corresponding atrophy of the thenar and hypothenar eminences. The skin of the right palmar surfaces was glossy and dry in comparison to that of the left. There was a slight improvement in the quality of the pulse. The right eyeball protruded slightly and there was also a slight ptosis of the right lid and persistence of the miosis. Roentgenograms showed that the mass in the left side of the chest had increased in size. The mediastinum was still very wide in the region of the operation, and the heart was in the median position.

Philippine Islands Med. Association Journal, Manila

17: 63-132 (Feb.) 1937

Tuberculosis Incidence in the Philippines as Revealed by X-Ray and Effective Preventive Measure Against the Disease. S. A. Francisco, Manila.—p. 63.
Parasitologic Oddities. C. M. Africa, Manila.—p. 83.
Admissions to the Cebu Maternity House in Six Years, from 1930 to 1935, Inclusive. C. Camomot, Cebu, Cebu.—p. 95.
Otogenic Serous Meningitis: Report of Recovered Cases. G. de Ocampo, Manila.—p. 101.

Public Health Reports, Washington, D. C.

52: 347-386 (March 26) 1937

Pulmonary Tumors in Mice: III. Serial Transmission of Induced Lung Tumors. H. B. Andervont.—p. 347.

52: 387-426 (April 2) 1937

Studies of Sewage Purification: VI. Biochemical Oxidation by Sludges Developed by Pure Cultures of Bacteria Isolated from Activated Sludge. C. T. Butterfield, C. C. Ruchhoft and P. D. McNamee.—p. 387.

Surgery, St. Louis

1: 487-654 (April) 1937

*Method of Testing Superficial Blood Circulation for Considering Indication and Proper Level of Amputation. G. Nyström, Uppsala, Sweden.—p. 487.
Ununited Fracture of Neck of Femur. W. C. Campbell, Memphis, Tenn.—p. 499.
Disruption of Abdominal Wounds: Unsolved Problem. A. M. Shipley, Baltimore.—p. 517.
*Postoperative Wound Separation: Review of Cases. L. S. Fallis, Detroit.—p. 523.
Applications of Cavity Grafting. A. H. McIndoe, London, England.—p. 535.
Homografting of Skin: Report of Success in Identical Twins. J. B. Brown, St. Louis.—p. 558.
Comparative Study of Physiologic Activity of Cobefrin and Epinephrine. E. B. Tuohy and H. E. Essex, Rochester, Minn.—p. 564.
Suggestion in Technic of Cholecystectomy for Complicated Case of Gallbladder Disease. H. P. Ritchie, St. Paul.—p. 581.
Edema in Surgical Patients. W. C. Curphey, Las Vegas, N. M., and T. G. Orr, Kansas City, Kan.—p. 589.
Diverticulosis of Small Intestine: Report of Three Cases. D. Guthrie and F. A. Hughes Jr., Sayre, Pa.—p. 593.
Diagnostic and Therapeutic Applications of Uterine Suction Curet. E. Novak, Baltimore.—p. 610.
Massive Congenital Fibromatosed Pigmented Mole of Scalp. H. W. Meyer, New York.—p. 616.
La Mettrie. W. M. Millar, Cincinnati.—p. 623.

Testing Superficial Blood Circulation for Determining Level of Amputation.—In the examination of the superficial circulation for determining the proper level of an amputation, Nyström has employed a method which causes an irritation of such intensity on the capillaries and small arteries that the greatest possible hyperemia is produced. The method is based on brief freezing of the skin with the aid of carbon dioxide snow. Fluid carbon dioxide is sprinkled in a little bag of velvet or leather, where it gathers in the form of snow. The snow is shaken out in a metal tube with a diameter of about 20 mm. and packed in a firm rod with the aid of a metal piston and a mallet. The ice rod is pressed against the skin for three seconds successively over the area to be tested in spots at a distance of from 5 to 10 cm. from each other. The procedure begins at the most distal point to be tested and continues upward. For comparison the same procedure is repeated on the corresponding parts of the other limb. In normal cases the white frozen spots of the skin thaw to normal consistency and color in about one minute. After another minute the hyperemia sets in and soon becomes maximal. The speed with which the hyperemia sets in and the grade of its intensity afford a certain guide as to the condition of the arterial supply. Also when the maximal effect is reached the hyperemic spot may be compressed with the finger for five seconds, then hastily removed, and with the aid of a stopwatch the seconds that elapse until the spot has again reached its maximal filling with blood are counted. Under normal conditions and in a horizontal posture, the refilling of blood takes an average time of from one to two seconds. The return of the blood to the anemized spot is of a flaming character. With a bad arterial supply the time may be extended to ten, fifteen or twenty seconds or more. In normal conditions an edema begins to appear in the spot after from ten to fifteen minutes and soon brings about a slight, sharply limited elevation of the skin. As to the practical application of the results of the examination, the author first tried to make the amputations immediately above the lowest spot that showed a good hyperemia and wheal formation, but later he found it safer to choose a somewhat higher level, from 10 to 15 cm. above the lowest spot, with good response of hyperemia and edema.

Postoperative Wound Separation.—Fallis states that postoperative wound rupture occurred in fifty of 7,903 consecutive laparotomies performed at the Henry Ford Hospital, an incidence of 0.64 per cent. It is the practice to perform secondary closure immediately. This is possible if the patients are moved to the operating room and operated on in their own beds. The use of local procaine hydrochloride infiltration plus subcostal block provides adequate relaxation if general or spinal anesthesia is contraindicated by the patient's condition. Forty-nine of the fifty patients had a secondary closure done. A seasonal variation is shown in the series. Multiple operations had been performed in 73.5 per cent of the cases. In 55 per cent of the cases the operation had lasted one and one-half hours or longer. Stay sutures of silkworm-gut or silver wire were used in 36.5 per cent. The clinical picture in the noninfective cases suggests an allergic reaction. The mortality following secondary closure was 34 per cent.

Virginia Medical Monthly, Richmond

64: 1-64 (April) 1937

Remarks on Prostatic Obstructions Observed During a Ten Year Period. J. H. Neff and E. W. Kirby, Charlottesville.—p. 1.
Problems in Diagnosis and Treatment of Peripheral Vascular Disease. N. Bloom and W. B. Porter, Richmond.—p. 7.
Roentgen Therapy in Inflammatory Conditions. W. P. Gilmer, Clifton Forge.—p. 15.
Radium in Treatment of Nonmalignant Diseases of Uterus. W. L. Peple, Richmond.—p. 16.
Hemihypertrophy: Case, Probably Acquired, Associated with Pituitary Tumor. F. A. Strickler, Radford.—p. 22.
*Deficiency Disease the Result of Interference with Absorption from Gastro-Intestinal Tract: Case Reports. T. D. Davis, Richmond.—p. 26.
Elimination of Back Flow in Uterosalpingography. O. D. Boyce, Rural Retreat.—p. 30.
Appendicitis and Children: Report of Case with Intestinal Parasite. W. P. Frazer, Hamilton.—p. 31.
Studies on Persistence of Action of Digitalis and Digitalis Bodies. H. B. Haag, Richmond.—p. 33.
Diagnosis of Appendicitis in Children. M. L. Carr, La Grange, N. C.—p. 38.
Orthopedic Treatment of Muscular Dystrophies and Muscular Atrophies. G. A. Duncan, Norfolk.—p. 40.

Deficiency Disease from Poor Gastro-Intestinal Absorption.—During the last fifteen years, Davis encountered eight patients who had well marked deficiency syndromes of the sprue type and in whom he made a diagnosis of nontropical sprue. The manifestations varied considerably in each case, which suggests that the underlying cause must not be exactly the same in all cases. On the other hand, the differences might be the result of the same factor operating on different individual constitutions. It is a dietary deficiency syndrome, which may be primary or may be secondary to chronic gastro-intestinal lesions. In the treatment of these patients a diet high in protein content but low in fermentable sugars and cellulose residue will make their abdomens more comfortable. Their carbohydrates may be made up with milk and lactose or possibly with bananas or banana powder. Liver extract or concentrated vitamin B complex may be helpful. If absorption is not adequate, the former may be given intramuscularly. Adequate amounts of calcium are indicated and again the injection method of administration may be advantageous. Some of the patients will have so much degeneration of their intestinal mucosa that it cannot be restored to function and the patient literally starves to death, even though he is ingesting adequate quantities of foodstuffs. Certain of these patients will be found to have localized intestinal lesions in the early stages which may be amenable to surgical resection.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

34: 1-84 (Jan.-March) 1937

*Gastric Acidity in Infants and Young Children Under Normal and Pathologic Conditions, with Especial Reference to Nutritional Anemia. Alice Stewart.—p. 1.
Schüller-Christian's Disease. F. R. B. Atkinson.—p. 28.
Apple Powder: Its Application to Intestinal Disorders: Simplification and Improvement on Heisler-Moro Raw Apple Diet. R. de Rohan Barondes.—p. 48.

Gastric Acidity in Children.—There appears to be no evidence that a congenital failure of gastric secretion is responsible for the development of the simple iron deficiency or nutritional anemias of infancy. Stewart therefore suggests that these anemias are the result of a pure deficiency in iron intake, which may date from before birth and is considerably influenced by prematurity. Once the anemia is established the general health of the child is lowered, intercurrent infections frequently occur and the acid secretion of the stomach is generally reduced. The absorption of the available iron is thus further impaired and a vicious circle is established. It is probable that infective states, particularly enteritis, play a part in the etiology of the iron deficiency anemias of childhood by causing chronic gastritis with suppression of acid secretion as suggested by Faber, but this point requires further investigation. It occurred to the author after completing the present investigations that, as so many of these patients are either premature infants or twins, a test meal examination of such children during the early weeks of life would be of interest. So far nine infants have been thus examined. At least a small amount of free acid was present in every case in spite of the comparatively high buffer action of the milk, which was shown by the total acid always reaching a considerably higher level. The average maximal free acid for the nine cases was 21.5 per cent of tenth normal solution and the average maximal total acid was 43.8 per cent of tenth normal solution. This preliminary investigation appears to support the foregoing contentions.

British Journal of Urology, London

9: 1-100 (March) 1937

Pathologic Physiology of Functions of Kidney. I. Snapper.—p. 1.
Idiopathic Dilatation of Bladder. K. H. Watkins.—p. 26.
Present Status of Dietary Regimen in Treatment of Urinary Calculi. C. C. Higgins.—p. 36.

Edinburgh Medical Journal

44: 129-204 (March) 1937

Clinical Notes on Eight Cases of Lymphogranuloma Inguinale (Climatic Bubo) and Its Sequels. R. C. L. Batchelor.—p. 129.
Clinical Recollections and Reflections: XI. Vomiting in Infancy. W. Brown.—p. 144.
Value of Examination of Contacts in Pulmonary Tuberculosis. G. S. Banks.—p. 153.
Bacteriology of Tuberculous Abdominal Adenitis. J. Smith.—p. 165.
Radiologic Aspects of Tuberculous Adenitis of Abdomen. D. P. Levack. —p. 172.
Surgical Aspects of Tuberculous Adenitis of Abdomen. W. Anderson. —p. 176.
General Prognostic Aspects of Tuberculous Adeniiis of Abdomen. W. Brown.—p. 180.
Pharmacology of Some Newer Drugs Employed in Tuberculosis Therapy. J. M. Johnston.—p. 184.

Irish Journal of Medical Science, Dublin

No. 134: 49-96 (Feb.) 1937

Critical Survey of Irish National Health Activities. C. Bastible.—p. 49.
Some General and Clinical Applications of Recent Research on Hemolytic Streptococci. R. C. Cummins.—p. 56.
Achrestic Anemia. L. Abrahamson and A. Thompson.—p. 66.
*Pyknolepsy: Report of Case. H. L. Parker.—p. 70.
Radiology in Diseases of Gallbladder. S. J. Boland.—p. 73.

Pyknolepsy.—Parker states that pyknolepsy is rare. Certain features of pyknolepsy tend to separate it from the more common clinical syndrome of petit mal. Girls are more commonly affected and the family history is usually free from epilepsy, insanity and kindred diseases. The onset is between the age of 4 and 10 years, and while in the case reported the disease came on gradually, more usually it is abrupt and overwhelming from the beginning. There is a stereotyped character of the attack as in petit mal such that it rarely changes its character throughout the course of the disease. The characteristic feature, however, is its extreme brevity, so that the whole attack is a matter of a few seconds and considerably shorter than the average course of petit mal. Another distinguishing feature is the extreme frequency with which these attacks occur. They may reach the striking total of a hundred a day. The degree of loss of consciousness is slight and is perhaps the principal feature. The patient never falls and may continue to carry out in a more or less efficient manner activities originally engaged in. While petit mal shows but little response to antiepileptic drugs such as bromides and phenobarbital, pyknolepsy does not respond at all. There are certain reasons why it is important to recognize pyknolepsy even though its existence as a clinical entity may be doubted. Some months or years may be necessary for this recognition, and caution must be used before reaching such a conclusion. In spite of the tremendous frequency of the attacks, there is little or no mental deterioration. Pyknolepsy runs a natural course and disappears at or about puberty as mysteriously as it came. In this it stands out supreme among the epilepsies as a benign affliction.

Lancet, London

1: 613-676 (March 13) 1937

Treatment of Acute Rheumatism in Childhood. R. Lightwood.—p. 613.
Nitrous Oxide Analgesia in Obstetrics: New Type of Machine for Self Administration of Gas. C. Moir.—p. 615.
Turmeric (Curcumin) in Biliary Diseases. A. Oppenheimer.—p. 619.
Anticurare Action of Substance 36: Closely Related to Prostigmin. Grace Briscoe.—p. 621.
Sporadic Salmonella Infections: Case Report. J. H. Fisher.—p. 623.
Hernio-Appendicectomy. J. T. Morrison.—p. 625.
Sulfhemoglobinemia Following Sulfanilamide Treatment. G. Discombe.—p. 626.

Medical Journal of Australia, Sydney

1: 313-348 (Feb. 27) 1937

Cardiac Pain. W. E. Fisher.—p. 313.

1: 349-386 (March 6) 1937

Heart Disease and National Welfare. A. R. Southwood.—p. 349.
Anxiety and the Heart, with Analysis of Cases. R. Whishaw.—p. 360.
Blood Transfusion: Closed Method of Collection and Administration. W. H. Milroy and A. D. Matheson.—p. 366.

Nature, London

139: 261-302 (Feb. 13) 1937

New Discovery of Three Skulls of Sinanthropus Pekinensis. F. Weidenreich.—p. 269.
*Nature of Causative Agent of Rous Fowl Sarcoma. E. M. Fraenkel and C. A. Mawson.—p. 282.
Effect of Vitamin E Deficiency on Thyroid. M. M. O. Barrie.—p. 286.

Nature of Causative Agent of Rous Fowl Sarcoma.—Fraenkel and Mawson have confirmed the fact that it is possible to deposit the agent from extracts of Rous sarcoma by centrifugation at 15,000 revolutions per minute, but they have been unable to obtain satisfactory correlation between the number of elementary bodies in different active preparations and the infectivity of the extracts. The supernatant after centrifugation is usually much less active and contains many fewer ultramicroscopic particles than the original extracts, but the infectivity of material concentrated many times on the centrifuge is seldom so active as would be suggested by the enormous numbers of elementary bodies present. Their impression is that the tumor-producing activity of Rous extracts is associated with material which can be deposited at 15,000 revolutions per minute, but they believe that only a small proportion of the elementary bodies visible in the extract can be associated with that activity, and they would emphasize that the possibility that the active agent is adsorbed on the surface of such particles cannot be excluded. The hypothesis of a purely chemical agent of the Rous sarcoma seemed to be confirmed when Jobling and Sproul claimed that repeated injections of an acetone extract of fresh Rous sarcoma tissue would produce similar tumors. Unless their technic has differed in some way the authors conclude that the results of Jobling and Sproul were due to fine suspensions of active material in their solvents. This possibility is enhanced by the fact that in their own experiments with dried powders the activity remained in the residue after extraction. This conclusion is disappointing from the point of view of the chemical hypothesis, but it does not exclude the conception suggested by virus-enzyme, as such a substance might be expected to be insoluble in acetone.

V 10
1937

Archives des Maladies du Cœur, Paris

30: 121-180 (March) 1937

Fallot's Tetrad Without Cyanosis. J. Fleury.—p. 121.
*Influence of Bodily Strain on Heart of Athletes: Cardiographic Study. M. Rosnowski.—p. 133.
Acrocyanosis. R. Cavalcanti.—p. 141.

Influence of Strain on the Hearts of Athletes.—Rosnowski has taken 203 electrocardiograms of skiers and marchers immediately before, during, and twenty-four and forty-eight hours after the strain. He took accurate measurements of the rhythm and the amplitude of the waves in all three derivations and made exact figures of each particular period of cardiac phases in the second derivation. All athletes have a bradycardia, but after a prolonged effort the duration of heart beats becomes shorter, often by 60 per cent of the space between the P and T waves. The space between the R and T summits goes down 16.4 per cent and the T wave itself 10 per cent. The P wave (auriculoventricular) is not always the same, but its average is generally increased 12 per cent. Concerning the rhythm there was a partial or sometimes even a total blockage of the bundle of His (lengthening of PR). Three subjects had a ventricular extrasystole, which disappeared in two after the strain but persisted in one. Four had a nodal arrhythmia before the strain, which disappeared after it and reappeared from twenty-four to forty-eight hours later. Sinusoidal arrhythmia is most frequently encountered. The autonomous nerves exercise a great influence on a strained heart, subjecting it to a sympathetic tonus during exercise and to a vagotonus soon after it. The development of the auriculoventricular waves (T) soon after the strain depend, according to the author, on the intensified work of the heart muscle. The enlarged T wave signifies a good functional adaptability of the ventricles, considering the energetic return of the cardiac muscle to a state of rest. The diastole or ventricular intermission is longer in paving the way for the succeeding systole, whereby the left ventricle carries the brunt.

Presse Médicale, Paris

45: 449-464 (March 24) 1937

*Against Decortication of Hydatid Cysts. Costantini and Oulié.—p. 449.
Pain Following Dental Extraction: Rôle of Sympathetic System in Pathogenesis and Treatment. M. Dechaume.—p. 451.
*Benign Meningitis of Swineherds. G. Charleux.—p. 452.

Decortication of Hydatid Cysts.—Costantini and Oulié find the Russian method of operation on hydatid cysts rather dangerous. This method is practiced at Karkhoff and Professor Melnikoff states that the closed cystotomy transforms a parasitic cyst into a nonparasitic cyst, that, except for large cysts, cystectomy is the operation of choice and that cystotomy is the operation of necessity. While Melnikoff's statements are based on thirty-four cases, Oulié's experience with 164 hydatid cysts led him to different conclusions shared by some other Russian schools which, though regarding decortication of hydatid cysts as an ideal operation, consider it dangerous if the cyst is embedded in the parenchyma, which would necessitate a further resection of the pericystic tissue of the liver. To do so is useless, since after Daniliak the fibrous capsule could not cause dissemination of the disease. Its structure will not permit the parasite to vegetate there. The authors are therefore much in favor of the classic procedure, which in aseptic cysts consists of puncture, formolization, aspiration of the liquid and, if possible, of the vesicles, wide opening and removal of the parasite and of existing vesicles, verification that the pouch has been well emptied, closure of the opening at different points and fastening to the abdominal wall. In suppurated cysts and in those containing bile, marsupialization of the pouch is practiced. This operation will obviate the immediate danger of hemorrhage and will also do away with belated casualties to the peritoneum from an accidental opening of the cyst.

Benign Meningitis.—Charleux gives the description of an acute benign meningitis encountered mostly among fruit gatherers of Switzerland and Savoy. This disease attracted some attention recently because from 5 to 10 per cent of the students of the dairy farms in Berne fell victims to it. It was found to attack mainly young laborers who, besides gathering fruit, are occupied in the making of cheese, the by-products of which are fed to pigs. These are probably the transmitting agents. The intermediary host is not known. The disease begins suddenly with chills and high temperature, coated tongue, vomiting, obstipation or diarrhea. The feces have the odor of pigs. Violent headaches and dull sensorium have often led to the diagnosis of typhoid or paratyphoid. Both torticollis and Kernig's sign are marked. The patient is often restless but shows no somnolence or delirium. There is often lymphocytosis but no change in mononuclears and polymorphonuclears. The diagnosis must be differentiated from tuberculous meningitis through the fact that the patient is well nourished and by considering the nature of his occupation. Furthermore, perspiration, cyanosis and slight eruption on the skin, added to the gastrointestinal symptoms, will facilitate the diagnosis. Lumbar puncture eases the headaches and seems to shorten the time of illness. Phlebotomy also gives good results, probably by reducing the cerebrospinal tension.

Schweizerische medizinische Wochenschrift, Basel

67: 305-328 (April 10) 1937. Partial Index

Development of Medical Bacteriology. W. Silberschmidt.—p. 305.
*New Points of View on Nature and Significance of Pelger's Nuclear Anomaly of Leukocytes. R. Stahel.—p. 308.
Renal Carbuncle with Multiple Cortical Abscesses in Other Kidney: Case. J. Bangerter.—p. 310.
Renal Diabetes. D. Sučić.—p. 312.
Caffeine Should Be Added to Strophanthin Injection. L. Bischoff.—p. 316.
Acute Aleukemic Myeloblastic Leukemia: Case. Schnyder.—p. 316.

Pelger's Nuclear Anomaly of Leukocytes.—Stahel directs attention to the nuclear anomaly of the leukocytes, which was first described by Pelger in 1930. The segmentation of the neutrophils does not exceed two segments, and numerous staff cells appear in spite of the absence of an infectious state of irritation. The nucleus of all segmented cells has the same well rounded pear-shaped outline. The nuclear structure is surprisingly coarse and lumpy. These coarse outlines are found also in the staff cells. Pelger's anomaly was first regarded as a hereditary disorder, with dominant transmission, which had no particular significance for the health of the person, but a connection with tuberculosis was likewise suggested, for tuberculosis was repeatedly observed in families and individuals who had Pelger's anomaly. A review of the literature of the cases of Pelger's nuclear anomaly demonstrates the frequent concurrence with tuberculosis. Especial attention is given to two cases in which the bone marrow had been examined. Observations in these cases and observations after the injection of a bacterial protein preparation indicate a special mode of reaction of the bone marrow. A connection with tuberculosis seems likely, since it might elicit a special bone marrow reaction. It is possible that the defense against infections is impaired in persons with Pelger's nuclear anomaly.

Ginecologia, Turin

3: 159-238 (March) 1937

*Late Sequels of Gravidic Pyelitis. E. Robecchi and G. Dodero.—p. 159.
Fertility: Technic for Morphologic Examination of Semen. G. Valle.—p. 179.
Relation Between Syphilis and Maceration of Fetus: Clinical and Statistical Study. G. Vurchio.—p. 191.
*Behavior of Testicle Following Interruption of Vas Deferens: Experiments. M. Bertini.—p. 207.
Fetal Anatomotopographic Modifications in Shoulder Presentation. E. Robecchi.—p. 221.
Fracture of Pelvis with Central Luxation of Head of Femur Restricting Size of Pelvis: Case. G. Bertone.—p. 233.

Late Sequels of Gravidic Pyelitis.—Robecchi and Dodero studied the frequency of late complications in gravidic pyelitis and the type of lesions left by the disease. In a group of eleven women suffering from typical gravidic pyelitis five or thirty months previously, the urine, taken by catheterization of the ureters, was examined and an ascending pyelography was made. In eight of the patients there were late sequels consisting in the presence of leukocytes and bacteria in the urine and dilatation of the ureters and of the pelvis. According to the authors, the gravity and permanence of the sequels that take place in gravidic pyelitis depend on the time of duration of the acute phase of the disease. They are unrelated to the time that elapses between the control of the disease and examination

of the patient. The authors emphasize the importance of early examination and treatment in patients who suffered from the disease, especially in case of a new pregnancy, in order to prevent development of sequels by controlling the disease before establishment of permanent organic alterations.

Behavior of Testicle After Interruption of Vas.—Bertini unilaterally interrupted the deferent duct in rabbits and observed the testicle for five months after the operation. The latter does not cause changes of the seminiferous epithelium. The alterations produced by the operation are dilatation of the epididymis and atrophy of the epididymal epithelium. The testicle shows no atrophy, but the spermogenic function is diminished. The testicular secretion, taken from puncture, showed the vitality of the spermatozoa to be good.

Giornale di Batteriologia e Immunologia, Turin

18: 145-288 (Feb.) 1937. Partial Index

Disinfectant Value of Denatured Alcohol. G. Marinelli.—p. 145.
Structure of Bacterial Colonies: Histologic Studies of Colonies of Tubercle Bacilli. H. D. Ravich-Birger and A. A. Svinkina.—p. 170.
*Action of Colloidal Carbon in Intravenous Injection on Organic Immunity Against Experimental Infection. D. David.—p. 186.
*Influence of Dextrose on Development of Immunity in Course of Active Specific Immunization. P. Cotrufo.—p. 202.
Modifications of Certain Biologic Properties of Eberthella Typhi in Relation to Culture Terrain. G. Martini and P. Visconti.—p. 223.

Action of Colloidal Carbon on Immune Reactions.—David gave intravenous injections of colloidal carbon to rabbits with experimental staphylococcic infection. He found that the substance does not produce shock and other complications. It acts by stimulating the organic reactions of defense (reticuloendothelial system), increasing leukocytosis and the phagocytic power of the blood and putting the animal in condition to ward off infection. Hyperleukocytosis takes place within three or four hours after the injection without intermission of hypoleukocytosis (the so-called depressive phase of the leukocytes). As the leukocytes increase in number, their phagocytic activity is also increased.

Influence of Dextrose on Immunity.—Cotrufo states that hypodermic injections of an isotonic solution of dextrose during the course of a specific immunization stimulates development of the general immunity. The powers of agglutination and fixation of the complement of the blood serum increase by the nonspecific action of dextrose. The author's statement is supported by the results of experiments in rabbits in the course of immunization against typhoid. The immune reactions in the rabbits that were given hypodermic injections of dextrose in the course of immunization were increased in comparison to those of rabbits in which immunization without simultaneous administration of dextrose was carried on. According to the author, the results of his experiments show the advisability of administering dextrose alone or with a specific treatment in infections.

Prensa Médica Argentina, Buenos Aires

24: 591-642 (March 24) 1937

*Intravenous Injections of Charcoal in Puerperal Infection. A. Peralta Ramos and Paulina Pelaez de Biondini.—p. 591.
Fractures of Elbow with Posttraumatic Cubitus Varus: Cases. R. Finochietto and R. L. Ferré.—p. 598.
Skin Reaction to Actinic Rays in Relation to Congenital Pigmentation of Skin. A. E. Rcffo.—p. 604.
Histopathogenesis of Inflammation. D. Deza Cenget.—p. 630.

Charcoal in Puerperal Infection.—Peralta Ramos and Pelaez de Biondini resorted to intravenous injections of animal charcoal in puerperal infection. The patients were seriously ill with an endometric localization of the infection and with or without retention of placenta. In four cases of the group there was septicemia. A daily injection of from 1 to 5 cc. of a 2 per cent solution of animal charcoal in distilled water was administered for six or eight consecutive days. The group included fifteen patients. The four patients suffering from septicemia died. In some cases the injection was followed by intense chills and high fever. In one case the injection was followed by grave shock. The authors conclude that the treatment may give satisfactory results in controlling puerperal infection of moderate intensity. It is not indicated in grave cases.

Archiv für Gynäkologie, Berlin

163: 327-486 (March 5) 1937. Partial Index

Experimental Study on Influence of Diet with Insufficient Variety on Hepatic Function During Pregnancy. G. Effkemann.—p. 327.
Structure of Female Urethra. E. N. Petrowa, C. S. Karaewa and A. E. Berkowskaja.—p. 343.
Significance of Hereditary Factors for Pathogenesis of Hypertension, Particularly of Essential Hypertension During Pregnancy. G. Tsutsulopulos.—p. 358.
Clinical and Pathologic-Anatomic Study on Hypofunction of Thyroid and Female Sexual Function. H. O. Neumann.—p. 406.
*Pregnancy Toxicoses and Tumors: New Points of View in Etiology of Tumors. G. von Bud.—p. 439.
Vitamin C Deficit During Pregnancy. G. Gaehtgens and E. Werner. —p. 475.

Pregnancy Toxicoses and Tumors.—Von Bud maintains that the pregnancy toxicoses are caused by focal toxins, for the therapeutic results he obtained with the extirpation of foci corroborate this. He points out that in a paper on convulsive eclampsia he called attention to the effects of focal toxins on the nervous system. Moreover, on the basis of his studies on eclampsia without convulsions, on ileus and pyelitis, and on the basis of clinical observations, he is of the opinion that the cause of puerperal fever is to be found in a disturbance of the nervous system, which in turn is elicited by focal toxins. On this basis could be explained also the diseases of the ovum and of the placenta and the congenital predisposition for disease. Malignant and benign tumors, which developed after some conditions of irritation of the nervous system (eclampsia) and after paralytic-atonic pregnancy toxicoses (ileus and pyelitis), directed the author's attention to the fact that the focal toxins not only exert an irritating effect on the nervous system but may lead also to tumor formation by way of trophic disturbances. He illustrates this possibility with four cases.

Deutsche medizinische Wochenschrift, Leipzig

63: 505-540 (March 26) 1937. Partial Index

Regional Differences of Normal White Blood Picture. M. Gänssler. —p. 505.
*Is Treatment of Pneumonia with Quinine Injections Justified? E. Ballmann.—p. 508.
Differential Diagnosis and Therapy of Palpitation of Heart. F. Schellong.—p. 510.
Cooperation of Diabetic Patient in Controlling Diabetes Mellitus. R. Pannhorst.—p. 513.
*Fluorescence Microscopy of Leprosy Bacteria in Nasal Mucus and in Blood. P. Hagemann.—p. 514.
Treatment of Rosacea. S. Bommer.—p. 518.

Quinine in Treatment of Pneumonia.—Ballmann points out that the injection of quinine permits an energetic attack of the cause of pneumonia without disturbing and moving the patient. At his hospital more than 2,000 patients were given injections of quinine preparations and the number of cases in which complications developed was small. He shows that the injurious effects of the injection of quinine preparations which have been reported in the literature could have been avoided if the necessary caution had been observed. He cites cases in which brachial nerves were paralyzed because inexperienced assistants or nurses had injected the quinine preparation into the arm. Quinine preparations, he says, should be injected by the physician himself and only into the gluteal muscle with a sufficiently long needle. If these rules are observed, the treatment of pneumonia with quinine injections is without danger and, compared to the merely symptomatic treatment, it shortens the disease process and reduces the number of complications and the mortality rate.

Fluorescence Microscopy of Leprosy Bacteria.—Hagemann describes a new method for the demonstration of microbes, particularly for the visualization of the causal organism of leprosy in the nasal mucus or in the thick drop blood preparation. The micro-organisms are stained by means of solutions of fluorescent substances, the so-called fluorochromes, and are then visualized by the fluorescence that develops under the influence of ultraviolet irradiation, under the special microscope. In order to detect leprosy bacilli, the specimen is treated for fifteen minutes with an aqueous solution of berberine sulfate containing phenol; then it is washed for from ten to fifty seconds with hot water (from 60 to 70 C.) and examined under the fluorescence microscope. The bacilli appear as yellow to green luminant rods, which stand out in contrast

V 10
1937

to the weaker fluorescing background. The author concludes that this method of demonstrating the organisms is in many respects superior to others. Moreover, fluorescence microscopy can be used also for the demonstration of tubercle bacilli, trypanosomes, plasmodia and so on.

Zeitschrift für Tuberkulose, Leipzig

77: 161-240 (March) 1937

Statistics on Success of Sanatorium Treatment of Tuberculous Patients. K. Zacharias.—p. 161.
Several Forms of Meningitis. B. A. Photakis.—p. 177.
*Unilateral Honeycombed Cavity of Lung on Bronchiectatic Basis. K. Sist.—p. 184.
*Quantitative Evaluation of Tuberculosis from Functional Blood Picture. O. H. Bucher.—p. 189.

Unilateral Cavity of Lung on Bronchiectatic Basis.—Sixt reports the clinical history of a young woman who for several years had received treatment in hospitals and sanatoriums on account of suspected open tuberculosis. However, on the basis of the long previous history, the extensive and unilateral pulmonary process in the presence of a relatively favorable general condition, the always negative sputum examination, the twice negative animal experiments and the outcome of the contrast substance filling tests, the pulmonary disorder was finally recognized as extensive bronchiectatic cysts of the right upper lobe with atelectasis and pleuritic changes in the left lower lobe. Tuberculosis could be excluded. Syphilis, which also occasionally produces aspects similar to those observed in this patient, could be ruled out on the basis of negative serologic reactions and of the absence of syphilitic symptoms. The author says that he reported this case not only because it is interesting, but particularly to stress the necessity of a thorough and careful examination before a patient is placed in a hospital or sanatorium for tuberculous patients.

Evaluation of Tuberculosis from Blood Picture.—Bucher thinks that the quantitative and qualitative changes in the leukocytic blood picture, which were investigated by Arneth, Schilling and others, may be regarded as a definitely established morphologic entity and maintains that they are suitable for the diagnosis of the tuberculous process from the blood. He points out that Hoefflin and Stanley succeeded in demonstrating in experiments that by counting the monocytes and the neutrophils with nonsegmented nuclei it is possible to estimate the intensity of a tuberculous infection. This idea of Hoefflin has greatly promoted the further development of the diagnosis from the blood picture. It has been determined that the neutrophils with segmented nuclei and the lymphocytes are biologically complementary. The sum of these two cell groups was utilized by Hoefflin for a geometric formula. After explaining this formula, the author says that he used it on the material of his clinic during the last two years and was able to corroborate the observations Hoefflin made on tuberculous cattle. The method makes it possible to determine (1) that a person never has had biologic contact with tubercle bacilli, (2) that a person is sensitized to tuberculin after the tuberculous foci have disappeared, (3) that a person has a passive tuberculosis and (4) that a person has active tuberculous foci, no matter whether the tuberculin reaction is negative or positive. The formula is also helpful in determining the prognosis and in estimating the efficacy of therapeutic procedures.

Wiener medizinische Wochenschrift, Vienna

87: 289-316 (March 13) 1937

Impairment of Skin by Occupations, Sports, Seasons and Cosmetics. M. Oppenheim.—p. 289.
Gastro-Intestinal Tract and Skin. E. Urbach.—p. 292.
*Form of Athletic Heart in Roentgenogram. V. Erdélyi.—p. 294.
Methods of Fever Therapy. K. Nowotny.—p. 295.

Athletic Heart in Roentgenogram.—Erdélyi studied the changes in size and shape of the heart in students who had undergone intensive physical training. He agrees with the majority of investigators, who consider the "athletic heart" a physiologic variant that develops in case of increased activity. He found that the hearts the size of which had temporarily or permanently increased as the result of intensive training in sports show great differences in shape. These differences are dependent on a number of factors, such as the shape of the thorax, the position of the heart and the changes in the tonus of the cardiac muscle. For instance, a heart that has a median position in a rather narrow and long thorax becomes more spherical in the course of enlargement. In a wide short thorax, however, the hypertrophy is more in the transverse direction and results in an aortic form. Between these two there are of course numerous intermediate forms. The author further explains the relationship between changes in the tonus of the cardiac muscle and the configuration, pointing out that in case of hypotonia the heart often appears pointed, whereas otherwise it is well rounded. He reaches the conclusion that there is no change in size or form of the heart that is characteristic for "athletes' heart" and that the roentgenogram alone cannot serve as basis for the diagnosis of "athletes' heart."

Polska Gazeta Lekarska, Lwów

16: 291-310 (April 18) 1937

Danger of Trachoma Epidemicity: Necessity of Government Aid to Combat Epidemic. E. Godlewski and K. Majewski.—p. 291.
Effects of Surgery on the Adrenals. Z. Dziembowski.—p. 293.
*Unapparent Chronic Pancreatitis. J. W. Grott.—p. 296.
Physiologic Irregularities of Pulse and Respiratoin. W. Tomaszewski.—p. 300.

Unapparent Chronic Pancreatitis.—Grott says that he has collected 100 cases of unapparent chronic pancreatitis in about two years, not including the cases which he could not verify with the following four points: possibility of diseased pancreas with complication of other organs, careful palpation of the region of the pancreas, search for sugar in the urine two hours after consumption of 50 Gm. of dextrose, and determination of the diastase of fresh urine. Among the 100 cases diagnosed as unapparent chronic pancreatitis there were forty male and sixty female patients, ranging in age from 20 to 70 years. There were liver disease complications in 56 per cent, general debility in 46 per cent, rapid loss of weight in 31 per cent, thirst in 16 per cent, pain in the side in 15 per cent and various other symptoms with insignificant percentage, such as itching in different parts of the body or the genital organs, ulcer of the duodenum and salivation. The treatment of chronic pancreatitis is often long drawn out: the first step is to remove the cause of the pancreatic disease and of that of the other organs. The most important item in the treatment is insulin, once or twice a day, each dose not to exceed 10 units.

Sovetskiy Vrachebnyy Zhurnal, Leningrad

March 15, 1937 (No. 5) Pp. 321-400. Partial Index

Improved Medical Aid to Women—Mothers. D. A. Glebov.—p. 321.
Essence of Immunity. G. D. Belonovskiy.—p. 325.
*Tuberculous Peritonitis in Children. N. V. Shwarts.—p. 331.
Treatment of Tuberculous Peritonitis with Large Doses of Calcium Chloride. T. Z. Gurevich.—p. 341.
Method of Combating Mycotic Diseases of Childhood. V. N. Levitan.—p. 343.
Choice of Incision or of Tonsillectomy in Peritonsillar Abscess. T. I. Gordyshevskiy.—p. 352.

Tuberculous Peritonitis.—According to Shwarts, there were admitted from 1925 to 1934 eighteen cases of tuberculous peritonitis to the pediatric section of the Tuberculosis Institute of Leningrad. Among 9,078 cases in which treatment was administered for various surgical conditions at the Rauchfus Children's Hospital in the course of seven years there were only seventeen cases of tuberculous peritonitis. The author is skeptical about the enterogenous origin of tuberculous peritonitis. He believes that in the great majority of the cases the primary focus is in the lungs. Tuberculous peritonitis is always secondary to tuberculosis of some other organ or tissue. It is seen most frequently as a concomitant lesion of the secondary stage of pulmonary tuberculosis, resulting from a lymphogenous or hematogenous dissemination from the primary focus. The most frequent sources in order of their importance are the lung and the peribronchial and mesenteric lymph node tuberculosis. In children the principal port of the tuberculous infection is represented by lung tuberculosis. The onset of tuberculous peritonitis in children is not infrequently stormy, with acute abdominal pain and high fever. Such cases are not infrequently confused with acute appendicitis, abdominal typhus and diplococcus peritonitis in girls. The author attaches much

importance to the study of the peritoneal fluid obtained by paracentesis in making a differential diagnosis. High specific gravity, high albumin content and the presence of lymphocytes differentiate an exudate from a transudate. The Gohn-Löwenstein method of culturing the peritoneal fluid on the newer mediums, such as the Petrignani milk-egg medium, yields a much higher number of positive results in finding Koch's bacilli than the older methods. General hygienic-dietetic treatment occupies the most important position in the treatment of tuberculous peritonitis. Operation is indicated in exudative forms when the conservative measures fail. The results are frequently quite favorable. It is, however, advisable to follow the laparotomy by a general treatment preferably of the climatic-sanatorium type. One should abstain from operating on nurslings, as the results are invariably bad. In adhesive and ulcerative-caseating types, the operation is indicated only when signs of increasing intestinal obstruction, of an acute peritonitis due to perforation of the intestine, are present, when the diagnosis is not clear and when cancer is suspected. The author applied the pneumoperitoneum method of therapy in several cases without, however, noticing any favorable results. Tuberculin treatment was not effective. Heliotherapy and other methods of irradiation, such as the quartz lamp, constitute a valuable adjunct and are indicated in cases in which the general state of the patient is fair and the pulmonary lesion is not far advanced.

Nederlandsch Tijdschrift voor Geneeskunde, Haarlem

81: 1217-1288 (March 20) 1937

Injuries of Menisci of Knee Joint. E. Hustinx.—p. 1218.
*Pseudo-Atrophy of Optic Nerve in Young Infants. K. T. A. Halbertsma. —p. 1230.
*Trigger Finger in Young Children. R. J. Harrenstein.—p. 1237.
Habitual Abortion: Case. J. P. Asjes.—p. 1242.
Aseptic Necrosis of Head of Humerus. P. M. E. E. Nijst.—p. 1243.

Pseudo-Atrophy of Optic Nerve in Young Infants.—Halbertsma reports the clinical history of a girl infant, 8 weeks old, who was brought to him by the parents with the complaint that the eyes had a peculiar staring expression which had made them fear that the child might be blind. The ophthalmologic examination revealed an abnormal behavior of the pupils and a peculiar coloration of the optic papillae. On the basis of another examination that was made three weeks later, the disorder was diagnosed as pseudo-atrophy of the optic papillae probably resulting from retarded myelinization of the pupillomotor fibers of the optic nerve. Several successive examinations disclosed a gradual improvement in that the pupillary reactions became more normal and the peculiar coloration of the papillae began to disappear. The author points out that this case corresponds to the description of pseudo-atrophy of the optic nerve in the new-born, which was given by Beauvieux in 1926. He also cites the signs which, according to Beauvieux, differentiate pseudo-atrophy of the optic nerve from the true congenital atrophy of the optic nerve.

Trigger Finger in Young Children.—Harrenstein points out that the so-called resilient, springing or trigger finger is characterized by a sudden arrest of the flexor and extensor movements of the finger. Palpation of the finger occasionally reveals a small swelling in the tendon at the metacarpophalangeal joint. The cause of the thickening of the tendon is unknown. The histologic examination of tissue specimens that were removed during operations revealed various changes. The treatment consists in rest and fixation of the finger on a splint or in forced stretching exercises with or without massage, warm baths and heat treatment. In some cases these measures are effective, but in others surgical treatment becomes necessary. Opening the narrow tendon sheath and removal of the thickening counteracts the difficulty. Thus the prognosis is comparatively favorable. The author further directs attention to the fact that the so-called trigger finger is often observed in young children. In these it is usually the thumb that is involved, often on both sides, whereas in adults the middle or ring fingers are most frequently affected. The author observed the disorder in twelve children, four girls and eight boys. The parents usually observed the defect when the children were between 1 and 2½ years old and without there having been an injury. Conservative treatment was always tried first. After first stretching the thumb, it was fixed on a metal splint. When this rest treatment gave no improvement, the parents were told to stretch the thumb several times each day. Some of the cases were cured by these conservative measures, but in four cases surgical treatment had to be resorted to. In two cases a cartilaginous thickening of the tendon could be demonstrated as the cause of the disorder.

Ugeskrift for Læger, Copenhagen

99: 319-354 (March 25) 1937

*Acrodynia (Pink Disease). P. Plum.—p. 319.
Id.: Case. C. Friderichsen.—p. 325.
*Fibrous Mediastinopericarditis (Fibrous Pericarditis) with Especial Regard to Surgical Treatment. D. Bøggild.—p. 328.

Acrodynia.—Plum states that more than 2,000 cases of acrodynia are known. The disease occurs almost exclusively in children up to the age of 14. The patients are usually from families in good circumstances. At the onset the child sits quietly or lies with his head in his pillow, is irritable, lacks appetite, has itching fingers and toes, and is thirsty, sleepless at night and dull by day. As a rule the noticeable pink color of the hands and feet appears about the fourth week. Occasionally an eruption may precede, with development of large white blisters, which break and lead to peeling. Other symptoms include pronounced perspiration, salivation and tear flow, falling hair, and possibly necrosis of the gingiva and finger tips. The temperature is normal, the pulse is greatly accelerated, the blood pressure may be increased. In the less typical cases, differential diagnosis with regard to simple anorexia and tuberculosis may be difficult. The picture in arsenic poisoning and ustilaginism resembles that in acrodynia. Acrodynia differs from pellagra in the absence of lines of demarcation, digestive symptoms, diet deficiency and history of pellagra in the family, and in the uniform age of the patients. The Woods found that in sixty-two cases the average length of time before improvement was twelve weeks. Angina, stomatitis, bronchitis, pneumonia, pyelitis and gastro-enteritis are complications. A mortality of from 5 to 10 per cent has been noted. Pneumonia is often the cause of death, but in some cases death is due to the disease itself. The course of the disorder is not influenced by diet, vitamin treatment, light, physical procedures or medicaments. The characteristic pathologic changes apparently consist of extensive but slight degenerative processes and slight inflammatory changes in the entire autonomic and somatic nervous system, except the cerebral cortex. A common specific etiology has not been determined. The picture of acrodynia, erythredema, trophodermatoneurosis or pink disease presents such uniform symptoms and so uniform a course that the disease is justifiably regarded as a well defined entity.

Fibrous Mediastinopericarditis and Surgical Treatment.—In both cases reported there was an exudative tuberculous pericarditis. In the second case the possibility of empyema of the pericardium led to exploratory pericardiotomy, which resulted in the bacteriologic diagnosis of bovine tuberculosis. Bøggild says that fibrous mediastinopericarditis occurs chiefly toward the end of childhood and in early adult life but may occur at any age except early and late. About one third of the cases are due to tuberculosis, about one third to rheumatic infection and the remainder to other known or to unknown causes. An exudate in the pericardium causes distention of the posterior part of the pericardium, resulting in compression posteriorly of the left lung. Stethoscopic signs of this were seen in the two cases. Heart embarrassment due to the exudate may cause liver stasis and ascites. Ascites is hastened after the acute phase and the fibrous changes, with atrophy, produce a mechanical obstruction. Both cases belonged to the concretio type. Cardiolysis, according to Schmieden, was done in the first case and Brauer's operation in the second. The author states that the operative treatment was undoubtedly life saving. The prognosis depends largely on the causative infection. The best results are attained in slowly developed cases. Intrapericardial pericardiolysis with pericardial resection is the procedure of choice. Operation should be performed before the heart musculature is too much affected.

V 10 1937